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The relationship between length of hospitalization and ward behavior in schizophrenic patients.

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THE RELATIONSHIP BETWEEN LENGTH OF HOSPITALIZATION AND WARD BEHAVIOR IN SCHIZOPHRENIC PATIENTS

A Dissertation Presented

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INTRODUCTION

Purpose

The purpose of the present investigation will be to determine the relationship between length of hospitalization and ward behavior in hospitalized schizophrenic patients. In order to assess such a relationship, a new procedure for observing and recording overt behavior will be utilized.

Length of Hospitalization

Theorists since Meyerson (1939) have claimed that the environment of the mental hospital serves to discourage social activities and individuality. Meyerson (1939) believed that the monotony of the hospital setting can often interact with the "social retreat" of the patient's schizophrenic disorder to produce a kind of "prison stupor" in schizophrenic patients.

More recently, Goffman (1961) has been concerned with the way in which large institutions such as mental hospitals seem to de-emphasize individual differences in hospitalized patients. Pace (1957) has suggested that the current treatment procedures for the schizophrenic fail to take the effects of hospitalization into account, and for this reason these treatments are often ineffective. Pace feels that as a result of their hospital experiences, long-term patients literally learn an incapacity for responsible extra-hospital life. The

existing treatment techniques, he suggests, are limited to treating "psychopathology", and thus, these treatments fail, for they ignore the learned incapacity of the long-term schizophrenic patient.

Some authors have considered length of hospitalization effects in attempting to account for the heterogeneous performance of hospitalized schizophrenics. Rabin, King, and Ehrmann (1955) have speculated that heterogeneous performance by schizophrenics on vocabulary usage tasks is in great part due to differences in the lengths of hospitalization of the subjects sampled. Using the following three measures of vocabulary performance: the Picture Vocabulary test, the Vocabulary subtest of the Wechsler-Bellvue I, and a detailed interview; these authors found that short-term schizophrenic patients (mean length of hospitalization = 1.5 years) performed at an overall higher level of vocabulary usage than long-term schizophrenic patients (mean length of hospitalization = 5.5 years). Wynne (1963) criticized the Rabin et al., study for their failure to control for severity of illness in the long-term and short-term groups. Wynne suggested that long-term patients might be more severely disturbed. Their vocabulary performance could then be attributed to their level of psychologic disturbance. Wynne attempted to replicate the Rabin et al., (1955) findings, but in his study he also attempted to control for severity of illness. Wynne matched long-term (mean length of hospitalization = 14.6 years) and short-term (mean length of hospitalization = 1.8 years) schizophrenic patients

on the severity of illness dimension using the Baker-Thorpe Rating Scale (1956). This scale has been found to be independent of length of hospital stay (Baker and Thorpe, 1956). Wynne's results confirmed the Rabin et al., findings. Again, short-term patients performed with a higher level of vocabulary usage than long-term patients.

McNamara (1966) found a relationship between conformity behavior on a perceptual task and length of hospitalization in paranoid schizophrenics. McNamara used an Ash-type procedure, where subjects were asked to match comparison lines with a standard line in the presence of three instructed confederates who made incorrect judgements on most trials. Long-term paranoid schizophrenics showed more conformity of perceptual judgements than did short-term paranoid schizophrenics.

Bernstein, Klein, Berger and Cohen (1965) found that length of hospitalization could effect the performance of schizophrenics on the Wechsler Adult Intelligence Scale. These authors gave the Wechsler test to 127 hospitalized male schizophrenics. A 20 x 20 correlation matrix of the Wechsler subtests with institutionalization and demographic variables was factor analyzed. Aging was found to effect Wechsler performance in schizophrenics in the same way as it effects normals. However, when the data was corrected for the effects of aging, a negative relationship was found between the Wechsler comprehension score and length of hospitalization. As the Wechsler comprehension subtest is thought to be one measure of so-

cial comprehension, Bernstein et al., suggested that the social comprehension of schizophrenics is depressed by increased hospital stay.

Cozens (1965) found a relationship between length of hospitalization, social withdrawal, and intellectual performance in schizophrenics. Cozens rated 60 hospitalized schizophrenics for level of social withdrawal. These subjects were then tested on the following five measures of intellectual performance: vocabulary; picture arrangement; paragraph memory; ideational fluency; and unlikely things. His results indicated that in the long-term schizophrenic patient, the higher the rated level of social withdrawal, the lower his intellectual performance, even with thinking disorganization partialed out. These findings did not hold true for the short-term schizophrenic patient. Moreover, after a short, but intensive program of social remotivation, Cozens found that the level of social withdrawal of long-term patients decreased, while their intellectual test performances increased.

The above findings on the effects of hospitalization in schizophrenics have been used to account for schizophrenic heterogeneity. Because of this heterogeneity, some other authors have looked to variables other than the length of hospitalization of the schizophrenic patient. The process-reactive dimension (Herron, 1962) and good pre-morbid - poor pre-morbid (Garmezy and Rodnick, 1959) dimension have been investigated recently in this regard. In addition, the grouping of schiz-

ophrenics into diagnostic subcategories (A.P.A. manual, 1952) has been used for a number of years in an attempt to account for differences in the behaviors of schizophrenic patients. However, once again it would seem necessary to take into account the length of hospitalization of the samples being studied. For example, in regard to the process-reactive dimension, Tyrell, Struve, and Schwartz (1965) noted that performance on a test of brain damage (the Yacorzynski Battery) was not primarily a function of pre-morbid history as rated from the Phillips scale (1953). However, total length of hospitalization was the major variable in accounting for the tendency of process schizophrenics to be diagnosed as brain-injured and reactive schizophrenics to be diagnosed as not brain-injured. Moreover, with respect to differences in performance of the different diagnostic subcategories in schizophrenia, Schooler and Long (1963) found no significant differences between hebephrenic, undifferentiated, catatonic, and paranoid schizophrenics on a task where the subject was forced to accept responsibility for the rewards of another. However, differences were found between the diagnostic subcategories when the length of hospitalization of the Ss was considered. In this study, Ss were asked to repeat a series of six digits read at one-second intervals by the E under three conditions. In the first condition ("benevolence"), the S was told that another S, unknown to him and in another room, would be given a dime for each number the S repeated correctly. In the second condition

("hostility"), the S was told that the other S had been given 42 dimes at the start of the trial and that one would be taken away for each mistake made. In the third condition (control), the S was told only how to perform the task. Although no differences were found between the diagnostic subcategories, differences were seen when comparisons were made of the correlations between length of hospitalization and the performance of Ss in different subcategories. It was found that as length of hospitalization increased, differences between the subcategories tended to disappear, e.g., male catatonics, initially more "hostile" became more "benevolent", while male paranoids, initially more "benevolent" became more "hostile". These findings, considered along with McNamara's (1965) results, would seem to add credence to the speculations of Goffman (1961) and others that large mental hospitals over time tend to foster conformity in their inmates by depressing the performance of certain behaviors.

Schooler and Parkel (1962) attempted to determine whether the presence of an immediate danger (hospital fire) reactivates relatively normal modes of behavior in the long-term hospitalized schizophrenic patient. Patients' reactions were evaluated through an analysis of mental hospital fire reports from records of the National Fire Protection Association, dating back to 1923. Interviews were also conducted with patients who had been in hospital fires. Both the fire records and the interview data supported the hypothesis that the longer the length

of hospitalization of schizophrenic patients, the more likely it is that these patients will be under-reactive and relatively unconcerned about their safety or the fate of others. These results are in agreement with Cozens (1965) and Bernstein, Klein, Berger, and Cohen (1965), for all suggest that an increase in length of hospitalization tends to be related to a decrease in social concerns and social activity.

As has been suggested above, the failure to adequately control for length of hospitalization effects has often led to confusion in the interpretation of research findings with respect to hospitalized schizophrenics. Bandura and Walters (1963) suggest that such confusion is inherent in research with such populations because the term "schizophrenia" implies a value judgement. These writers believe that when the concept of "schizophrenia" is applied as a criteria for subject selection in psychological research, we may be engaging in an act of reification of a non-existent disorder. Bandura and Walters suggest that the result of this type of research procedure is often a denial of heterogeneous findings and an attempt to explain away such findings. The issues raised by these authors deserve comment. It is suggested that the use of directly observable behavioral indices is one way to clarify these issues. Further, it is suggested that we should attempt to obtain a sufficient number of reliable behavioral differences between schizophrenic patients, and that we should also attempt to isolate the relevant variables which seem to account for such differences. If we do this, then we will be

closer to an empirical evaluation of the concept of "schizophrenia". However, we must realize that the concept of "schizophrenia" is being used as a diagnostic and prognostic tool by those who have authority over the hospitalized patient. Moreover, once a person has been labeled a "schizophrenic" and has been hospitalized as such, this person is treated in particular ways that are relevant to the roles implied by this label. Thus, it would seem to be inappropriate to ignore the labeling of other professionals, even if that labeling itself may be faulty. In order to fully evaluate the label of "schizophrenia", we will have to evaluate the behaviors of those so labeled. As long as the researchers remain open to such important variables as length of hospitalization, an evaluation of the concept of "schizophrenia" can also be sought.

In general, then, length of hospitalization appears to be an extremely important variable effecting many forms of behavior in the hospitalized schizophrenic patient. However, the question arises as to whether it is possible to observe more accurately the effects of hospitalization on the overt behaviors of the schizophrenic. In other words, can such effects be seen as relevant to the behaviors of the schizophrenic patient as he interacts within his environment; that is, on the ward of a large neuropsychiatric hospital? In this regard, Hunter, Schooler and Spohn (1962) suggest that the lack of reliable techniques for the measurement of patient behavior accounts for the paucity of objective behavioral studies dealing with such patients. Moreover, in those studies that have attempted to observe the ward

behaviors of the hospitalized schizophrenic patients, no attempt has been made to examine the effects of the length of hospitalization on these patients. This length of hospitalization variable has been neglected despite the fact that such studies have consistently found differences in the ward behaviors of the schizophrenic. For example, Schooler and Spohn (1960) have studied the social interactions of schizophrenic patients on a closed ward of a hospital. Fifty patients were observed daily for 5 weeks with the observations averaging an hour in length. The observer systematically recorded all instances of social contact between patients. The results showed a paucity of social interaction, with 66% of the ward patients participating in either no social relationships or in relationships with one or two patients which were infrequent and tenuous. However, a small group of frequently socializing patients was also observed. This group was found to have both a larger number of social relationships, and a larger frequency of social contact within these relationships.

Hunter, Schooler and Spohn (1962) also found differences in the ward behavior of hospitalized schizophrenics. These authors developed the Location-Action-Inventory which was designed to measure: (a.) the position and posture of a patient; (b.) his location with respect to the environment of the ward; and (c.) the patient's behavior to the varied stimuli of the ward environment. This third category, patient behavior, was divided into several broad classes. These were: (1.) "social

activities" - verbal-social, gestural-social, laughing-social, and social games; (2.) "parasocial activities" - reading, writing, non-social games, television viewing; (3.) "functional, non-social activities" - ward service, personal care, excretory, and functional object manipulation; (4.) "non-functional activities" - self-manipulation, active movement, non-functional object manipulation, verbal, gestural and laughing non-social; (5.) "no behavior" - "null" behavior and sleep. One hundred male schizophrenics were observed. The ward was divided into 14 geographic areas and the observer walked through each area on a predetermined route, recording (1.) the identity of all patients of an area; (2.) the postions of such patients; and (3.) each patient's activity as defined by the five broad classes. Patients were observed for a maximum of ten seconds. A patient's behaviors were considered to be mutually exclusive. That is, if the patient were engaged in more than one activity, the observer had to make a decision as to which behavior was the most salient. The results of the observations showed that patients spent 44% of their waking time engaged in null behavior and 11% of their time sleeping. Only 2.7% of the patients' time was spent engaged in social activities. However, many of the patients in the sample did not engage in any social behavior; although a small group of patients were found to consistently engage in social activities. These socializing patients were also found to exhibit less "null" and "non-functional" ("pathological") behaviors and more "parasocial" and

"functional-social" activities than the non-socializing patients.

The results of Schooler and Spohn (1960) and of Hunter, Schooler and Spohn (1962) would seem to be consistent in finding: (1.) a dearth of social interaction in the ward behaviors of schizophrenic patients, and (2.) the presence of two groups of patients, a majority of non-socializers and a small group of patients who tend to socialize. Moreover, the results of Hunter et al., (1962) indicate that the group of socializing patients differs from the non-socializing patients in a number of ways, such as in performing fewer "pathological" and "null" behaviors, and in engaging in more "functional-social" behaviors. As the effects of hospitalization have been discussed, it has been suggested that this length of hospitalization variable can be related to many kinds of behavior that the schizophrenic performs. It is now suggested that there is an important relationship between the length of hospitalization of schizophrenic patients and the ward behaviors that have been observed in the patients in the above studies. In other words, the cumulative effects of increased hospitalization may have had a depressing effect on the social and "functional-social" activities of hospitalized schizophrenics. Further, increased hospitalization may be depressing more adequate, adjustive ward behaviors in the schizophrenic patient, and thereby, leave the patient with a variety of behavioral deficits. These deficits may then remain as "null" behaviors, or other, more inappropriate ("pathological") be-

haviors may take their place. In order to adequately determine whether length of hospitalization can have the pervasive behavioral effects that have just been suggested, an objective procedure for observing and recording such behaviors must first be developed.

Observation and Recording of Behavior

Boyd and DeVault (1966) raise some important issues concerning the observation and recording of behavior. These authors discuss two types of observation procedures; structured observation and unstructured observation. Most of the observational data which is concerned with the hospitalized schizophrenic patient has been gathered by use of the structured observation method. For example, Spohn and Wolk (1966) were interested in observing social participation of chronic schizophrenic patients in heterogeneous and homogeneous groups. To study these behaviors, the authors created four-man groups of chronic schizophrenics, where subjects were instructed to solve five group problems in succession. Each subject participated in the problem-solving situation twice; once in a group composed of four subjects of the same level of mental health adjustment, and once in a group of two withdrawn, regressed subjects and two active, improved subjects. Mental health was measured by the subjects' scores on the Montrose Adjustment Rating Scale. Spohn and Wolk found that the mean social participation scores for subjects in remission were considerably higher than those of the regressed subjects, regardless of

group composition. Although the knowledge gained from this kind of study is useful, there would seem to be some problems related to the use of structured observation procedures. As Catell and Digman (1964) point out, structured observation situations may distort or inadequately report the dynamics of human behavior and interaction. In regard to the Spohn and Wolk data, there would seem to be a great deal of difference between the artificial "social participation" of a problem-solving group, and the kind of voluntary social participation that occurs on a neuropsychiatric ward.

On the other hand, real and basic problems are encountered in the use of unstructured observation. According to Boyd and DeVault (1966), two major problems are the presence of undefined constructs, and the inability to record even an appreciable fraction of what an observer does see. In order to deal with these difficulties, some workers have confined their observations of mental patients to small, well-delineated categories. For example, Jones (1941) studied the spontaneous bodily movements of mental patients in a hospital setting. Using a time sampling technique, Jones made 20 observations of 120 hospitalized patients. Five patients were observed at one time with each observation period lasting for five minutes. The patients were selected randomly from hospital wards, and the time sampling was randomized - with the only restriction being that there were no observations during evenings or weekends. Only small, spontaneous bodily movements were recorded. These movements were divided into nine categories, each cat-

egory being concerned with that part of the patient's body where the movement had been observed. Jones found his observation procedure to be quite effective in determining and measuring the bodily movements of the observed patients. His results indicated that spontaneous bodily movements in one part of the body were unrelated to spontaneous bodily movements in any other part of the body. Jones also found that two independent observers watching the same group of patients at the same time, and each scoring bodily movements according to the nine categories, could obtain high interobserver reliability.

Although Jones' results are interesting from a methodological point of view, his findings do not seem to appreciably increase our understanding of the kinds of behavior that are relevant to the hospitalized schizophrenic's environment. In order to understand more adequately the overt behavior of hospitalized schizophrenics, it has been suggested that an unstructured observation procedure is necessary. As Whyte (1951) points out, anthropologists by the nature of their subject matter are frequently forced to employ unstructured observation procedures in a poorly controlled fashion. However, from the previous discussion of Jones' findings, it can be reasoned that unstructured observation data must also be sufficiently inclusive to make one's findings meaningful. It would thus seem that some balance is required in the choice of the kind of interpretive behavior categories to be measured,

and in the observation techniques and procedures to be employed.

A New Technique for the Observation and Recording of Behavior

Lovaas, Freitag, Gold, and Kassorla (1965) working with child observations, point out that in most observational studies the recording methods are typically written accounts. These authors feel that there are certain disadvantages associated with this type of procedure, such as the amount of attention the observer must give to the mechanics of recording rather than to whatever is being observed, and the difficulty in measuring the durations of a particular behavior. They have, thus, attempted to develop an apparatus and procedure to facilitate behavior recordings. The apparatus for quantifying behaviors involves two units: an Esterline Angus twenty-pen recorder and an operating panel with twelve buttons, each button mounted on a switch. When depressed, these buttons activate a corresponding pen of the Esterline recorder. The buttons are arranged on a 7 x 14 inch panel, in the configuration of the fingertips of an outstretched hand. Each button can be pressed independently of any of the others and with the amount of force similar to that required for an electric typewriter key. Lovaas et al., observed various behaviors of a child and an attending adult in a nursery playroom. These behaviors were defined; each behavior corresponding to a designated button on the panel. The apparatus thus enabled the observers to keep a running account of both the frequency and the duration of each of these behaviors. The behaviors were placed into nine categories

dealing with the child's verbal, nonverbal-social, and non-social behaviors. Only those behaviors which seemed to be members of larger response classes were considered.

Lovaas et al., (1965) employed their apparatus in a series of studies. Children were observed through one-way mirrors; the observers remaining in an adjoining room. The observation periods lasted for from 20 to 60 minutes, during which time the child's and the adult's behaviors were recorded according to the Lovaas et al., categories. The results showed interobserver reliability to be extremely high. Behavior changes over time were also studied by observing a 9 year old autistic girl over the course of several months. An attempt was made to see the degree to which the behavior categories might differentiate between autistic and normal children, and between normal children of different ages. Observations of the free play behavior of a 9 year old autistic child were compared with those of five normal children of varying chronological age in the same setting. It was found that when compared with normals, the autistic child behaved like the very young children -- the one-half and the one year old. These children seemed to engage more often in non-social behaviors. The autistic child was the only child who was observed to be atavistic in this setting. When the normal children of various chronological ages were compared on the various behavioral categories, some of the categories did differentiate between the various groups, while others did not. As examples, the authors state that their Social Non-

verbal category, which they defined as "socially acceptable" nonverbal activity in response to cues from the attending adult, did not seem to discriminate between children above two years of age. On the other hand, their Verbal I category, which they defined as intelligible, nonrepetitive verbal behavior, provided for a discrimination between each age category. This Lovaas et al., apparatus would seem to be quite useful for observational research.

Harmatz, Mendelsohn and Glassman (1969) have utilized an apparatus which is similar to the one used for behavioral recordings by Lovaas et al., (1965). While Lovaas and his colleagues had been interested in developing a technique for behavior recording of children, Harmatz et al., (1969) have developed the Behavioral Observation System. This system utilizes an Esterline pen recorder-operating panel apparatus along with procedures for an observational study of behavior in naturalistic settings. The observational procedures have been modeled after the scientific methods of ecology (see Harmatz, 1968). Harmatz et al., have developed a behavioral classification system which includes all of the behaviors of the schizophrenic patient as he interacts with his characteristic environment -- the ward of a large neuropsychiatric hospital. Some preliminary work has indicated the relevance of twelve Behavioral Categories for the hospitalized schizophrenic patient. The twelve Behavioral Categories have been used in conjunction with the Esterline pen recorder-operating panel apparatus so that an observer can

keep an accurate, running account of both the frequency and the duration of the behaviors subsumed under the Categories. Thus, use of the Behavioral Observation System will enable a researcher to observe and record all of the behaviors of the hospitalized schizophrenic patient.

Harmatz et al., (1969) employed their apparatus and procedures in a series of studies. Schizophrenic patients were observed on a closed ward of a Veterans Administration Hospital. An attempt was made to assess interobserver reliability by having two independent observers simultaneously observe the same patient. Each observer used a separate model of the Esterline pen recorder-operating panel apparatus, and the observers were separated from each other by a large wall cabinet. Interobserver reliability was found to be quite high. An attempt was made to find the optimal observation time interval. Patients were observed for 5, 10, 15, and 20 minute periods, and also for one-hour segments of time. Comparisons were made between the various smaller time periods and the one-hour segments. Ten-minute observation periods were found to yield an accurate picture of the larger time segments for the hospitalized schizophrenic patient. Intrasubject consistency of behavior was assessed by comparing pairs of ten-minute observation periods for a group of hospitalized schizophrenic patients. Consistency was assessed for each Behavior Category. Intra-subject consistency was found to be high for each of the 12 Behavioral Categories.

Thus, the Behavioral Observation System appears to be an effective answer to some of the methodological problems involved in the observation of hospitalized schizophrenic patients. It is suggested that the use of this system may help to clarify some of the behavioral correlates of the length of hospitalization of the schizophrenic patient.

Toward Some Hypotheses

It has been suggested that length of hospitalization may effect the performance of schizophrenic subjects on a variety of tasks. It has also been suggested that length of hospitalization may be a key variable in accounting for differences in the ward behaviors that have been observed in studies of hospitalized schizophrenics. Further, a new apparatus for the observation and recording of behavior has been described, and it has been suggested that this apparatus may be useful in clarifying what behavioral effects length of hospitalization may have on hospitalized schizophrenic patients.

One approach which may be used to determine the effects of length of hospitalization is the cross-sectional design. That is, both the long-term and the short-term hospitalized schizophrenic patients can be observed. These patients must, at the time of observation, differ only in terms of their lengths of hospitalization. Thusly, if differences in behaviors are found between these patient populations, then it might be reasoned that these differences might reflect cum-

ulative length of hospitalization effects. However, it must also be acknowledged that there are certain difficulties involved in using such a methodological approach. Firstly, it is suggested that all of the variables that might otherwise effect the behaviors of both the long-term and the short-term hospitalized schizophrenic patients can never be fully controlled. Secondly, even if behavioral differences are found between the length of hospitalization groups, it is hard to then say from what these differences result. Are such differences merely the result of the passage of time within the hospital, or are they the result of the cumulative effects of certain psychological processes which are involved in the hospitalization experience? Thirdly, another problem which is related to the cross-sectional approach must also be considered. This involves the determination of the direction of any cause-effect relationship which might arise from the data. In the present research, a question posed by the findings would be, "Are hospitalization effects the cause of any behavioral differences which may be found, or is long-term hospitalization the result of such behavioral differences?" Although such cause-effect questions are not peculiar to the cross-sectional design when time is used as a variable, this design does make the clarification of such issues more difficult. However, in spite of this, it is the belief of this writer that such designs should be used, and such studies should be attempted. We still know very little about the be-

haviors of the hospitalized schizophrenic patient. If a study such as the present one can be helpful in revealing consistent findings regarding the behaviors of the hospitalized schizophrenic, then such studies are surely valuable. We must first look at how hospitalized schizophrenic patients behave. Then we will be in a better position to determine why such behaviors occur.

The purpose of this present investigation, then, is to determine whether long-term hospitalized schizophrenic patients differ from short-term hospitalized schizophrenic patients in their various ward behaviors. The following four hypotheses will concern in detail how this length of hospitalization variable may effect certain ward behaviors. A fifth hypothesis will concern the use of group profile analysis.

Hypotheses

1. Social Behaviors. Previously, it has been suggested that social behaviors may be depressed in hospitalized schizophrenics through length of hospitalization (Schooler and Parkel, 1962; Bernstein, et al., 1965; Cozens, 1965). The large mental hospital can be characterized by such conditions as a lack of social stimulation (Meyerson, 1939), and possible negative attitudes of the staff toward active, social patients (Allyon & Michael, 1959; Ullmann and Krasner, 1965). It can be reasoned that these conditions may lead to the suppression of Social Behaviors through negative reinforcement, and to their extinction through nonreinforcement. Thus, it is hy-

pothesized that long-term hospitalized schizophrenic patients may be observed to display less Social Behavior than short-term hospitalized schizophrenic patients.

2. Functional Behaviors. In the same way that social behaviors would appear to be suppressed and/or extinguished in the hospital setting, it can be reasoned that other behaviors might similarly disappear from the long-term schizophrenic's repertoire. One such type of behavior will be called "Functional" (Hunter, et al., 1962). Given the monotony of the ward setting, it would appear to be "functional" to keep oneself absorbed in those recreations that are available, such as games, television, reading, etc. However, as Ullmann and Krasner (1965) point out, one result of the use of a medical model in the treatment of the mental patient has been that this patient is placed in the role of a passive, helpless inmate. It can be surmised that such "functional" behaviors as those that have been described would not fit well into the staff's conception of this passive role. Therefore, it is suggested that these behaviors actually might be effected by length of hospitalization in the same way as Social Behaviors. In other words, these "Functional" Behaviors might also tend to disappear from the schizophrenic's repertoire through suppression and/or extinction. Thus, it is hypothesized that long-term hospitalized schizophrenic patients may be observed to display less "Functional" Behavior than short-term hospitalized schizophrenic patients.

3. Null Behaviors. It has been suggested that long-

term hospitalization can suppress or even extinguish Social and "Functional" Behavior in schizophrenics. It would seem to follow that behavioral deficits (Ferster, 1961) would be likely to occur in the schizophrenic patient as a result of the disappearance of the two above types of behaviors and the unstimulating environment of the ward. Further, it is proposed that these behavioral deficits can be equated with the absence of observed behaviors, i.e., "Null" Behaviors (Hunter, et al., 1962). Thus, it is hypothesized that long-term hospitalized schizophrenic patients may be observed to display more "Null" Behavior than short-term hospitalized schizophrenic patients.

4. Pathological Behaviors. It can be reasoned, further, that inappropriate or "pathological" forms of behavior will also result from increased length of hospitalization. With the existence of behavioral deficits, the long-term hospitalized schizophrenic patient might more easily learn inappropriate instead of appropriate types of behaviors. This would seem likely for the following reasons: (1.) fewer opportunities for learning appropriate behavior seem to exist in the hospital setting (Goffman, 1961); (2.) inappropriate behaviors might be directly learned because they bring the patient attention from the hospital staff (Ullmann & Krasner, 1965; Gelfand, Gelfand and Dobson, 1966); and (3.) evidence from sensory deprivation studies (Wexler, Mendelson, Liederman and Solomon, 1958; Fiske, 1961) suggest that deprived environments

can often produce "Pathological" Behaviors. Thus, it is hypothesized that long-term hospitalized schizophrenic patients may be observed to display more "Pathological" Behavior than short-term hospitalized schizophrenic patients.

5. Group Profiles. In addition to the above hypotheses, it is proposed that an investigation of the various observed ward behaviors of the schizophrenic patient, using the techniques of profile analysis (Cronbach and Gleser, 1953; Sawrey, Keller, and Conger, 1960) may yield two distinctive group profiles. These two profiles will involve different combinations of ward behaviors of the hospitalized schizophrenic, and will thus help to delineate further the long-term hospitalized schizophrenic patient from the short-term hospitalized schizophrenic patient.

METHOD

Subjects

Forty-two male subjects were observed on two closed wards at the Northampton Veterans Administration Hospital. These Ss were divided into four groups. The groups were divided on the basis of the length of hospitalization of the Ss. Length of hospitalization was considered as the length of time of a patient's most recent, continuous hospitalization. The first group consisted of seven patients who had been hospitalized for up to four months. The second group consisted of seven patients who had been hospitalized for from four months to one year. The third group consisted of seven patients who had been hospitalized for from one year to two years. The fourth group consisted of twenty-one patients who had been hospitalized for 8 years or longer. The Ss in the first three groupings were considered "short-term" patients (ST). That is, this total of 21 Ss had been hospitalized for up to two years. The Ss in the fourth group were considered "long-term" (LT). That is, this total of 21 Ss had been hospitalized for 8 years or longer.

The above breakdown of patients by length of hospitalization into a long-term group and a short-term group is in agreement with previous research designs (Rabin, et al., 1955; Wynne, 1963). The further subdivision of the short-term group is based on the suggestion made by some authors (Brown, 1960;

Wynne, 1963; Watt and Buglass, 1966) that for both first and subsequent admissions, two years of hospitalization is the critical dividing line between discharge and continued hospital stay. This division of Ss, then, allowed an analysis of long-term - short-term differences, and a further, more detailed analysis of possible differences within the short-term group.

Also an attempt was made to have Ss in all four of the groups be as homogeneous as possible with respect to all major demographic variables, excepting length of hospitalization. Subjects were thus matched for the following variables: (1.) a schizophrenic diagnosis; (2.) absence of known organic pathology; (3.) age; (4.) age of onset; (5.) severity of illness at admission; and (6.) socio-economic status. Previously, these variables have been found to be of prognostic value in evaluating schizophrenic populations (Phillips, 1953). The demographic information concerning diagnosis, organic involvement, age, age of onset, and length of hospitalization were taken from each S's clinical folder. The severity of illness of each patient was rated with the Baker-Thorpe rating scale (1956). This scale has been found to be independent of length of hospital stay (Baker and Thorpe, 1956). Socio-economic status was rated using the Two-Factor Index of Social Position (Hollingshead, 1965).

Apparatus

The Behavior Observation System (BOS). The BOS consists of a machine for recording observed behaviors and a system of 12 Behavioral Categories.

Behavior Observation Apparatus. The apparatus for quantifying the observed behaviors involved two units: an Esterline-Angus twenty-pen recorder and an operating panel with twelve buttons, each of which is mounted on a switch. When depressed, each button activates a corresponding pen of the Esterline recorder. The buttons are arranged on a 7 x 14 inch panel in the configuration of the fingertips of an outstretched hand. Each button can be pressed independently of any of the others and with the amount of force similar to that required for an electric typewriter key. Various patient behaviors were observed, defined, and recorded using this apparatus. These behaviors were subsumed under twelve Behavioral Categories, each of which corresponds to a button on the operating panel. The apparatus thus enabled the observer to keep an accurate, running account of both frequency and duration of the behaviors subsumed under each of the below Behavioral Categories.

Behavioral Categories. Previous research (Harmatz, et al., 1969) has indicated the relevance of 12 Behavioral Categories for the hospitalized schizophrenic patient. The Behavioral Categories and their definitions are the following:

(1.) Non-Involvement (NI) - defined as the absence of quantifiable behavior;

(2.) Self-Stimulatory (SS) - defined as any repetitive behavior which appears to be stimulating to the individual, ie., scratching oneself and fondling oneself;

(3.) Pacing (PAC) - defined as aimless walking activity;

(4.) Bizarre (BZ) - defined as any unusual or odd behavior, ie., talking, gesturing, and laughing to oneself;

(5.) Atavistic (ATV) - defined as any behavior which is destructive toward oneself or toward others, also any annoying or aversive behavior;

(6.) Verbal I (VB1) - defined as nonrepetitive, intelligible verbal behavior between a patient and any other patient;

(7.) Verbal II (VB2) - defined as nonrepetitive, intelligible verbal behavior between a patient and any non-patient;

(8.) Reinforcement (Rein) - defined as seeking physical reinforcement;

(9.) Non-Verbal Interpersonal (NVI) - defined as any "socially acceptable" nonverbal activity;

(10.) Passive Entertainment (PE) - defined as any entertainment-seeking behavior which demands minimal physical activity, ie., watching television and reading a book;

(11.) Active Entertainment (AE) - defined as any entertainment-seeking behavior which demands physical activity, ie., playing cards and playing pool;

(12.) Non-Classificatory (NonCl) - defined as any observ-

able behavior which can not be subsumed under any of the other eleven categories.

Patient behaviors were observed and recorded under these above 12 Categories. The Categories were then analyzed as to their various combinations in the long-term and short-term groups (see Hypothesis section, Hypothesis 5, p. 24). Some of the original Categories were also combined into four Behavior Classes. These Classes were constructed in order to test the first four hypotheses (see Hypothesis section, p. 21).

Behavioral Classes. Nine of the original Behavioral Categories were combined into four broad Behavioral Classes. These Behavioral Classes were based upon the classes used by Hunter, Schooler and Spohn (1962), and they concerned "Social", "Functional", "Null", and "Pathological" Behaviors. The Classes and their respective Behavioral Categories are the following: (1.) "Social Behaviors" - formed by combining Verbal I, Verbal II, and Non-Verbal Interpersonal Behaviors; (2.) "Functional Behaviors" - formed by combining Active Entertainment and Passive Entertainment Behaviors; (3.) "Null Behaviors" - formed by combining Non-Involvement and Self-Stimulatory Behaviors; and (4.) "Pathological Behaviors" - formed by combining Bizarre and Atavistic Behaviors.

Procedure

Ratings

(a.) Severity of Illness. Ratings were performed to determine the "severity of illness" of the patient on admission to

the hospital. The Baker-Thorpe (1956) rating scale was used. This scale is a ten-item check list with each item on a four-point continuum. This continuum measures the severity of illness. The scale has been found to be easily understood by hospital staff, and to correlate highly with longer, more "sophisticated" measures, such as the Lorr Scale (1962) (Wynne, 1963). The total score on this scale is independent of length of hospital stay (Baker and Thorpe, 1956). The total possible score is 40, with the highest score indicating the greatest "severity of illness". Ratings were performed for each patient by a psychology graduate student, using information gathered from nursing notes written on the day of the patient's admission. The score of the rater for each patient was considered to be the patient's "severity of illness" score.

(b.) Socio-Economic Status. Ratings to determine each patient's socio-economic status (SES) score were made using the Hollingshead (1965) Two-Factor Index of Social Position. This index derives the social position of an individual by integrating the factors of occupation and education. An occupation scale is included with a 7-step hierarchy ranging from unskilled laborer to highly skilled professional. Also used is an education scale which is divided into a 7-step hierarchy ranging from less than 7 grades of schooling to completion of recognized graduate training. Subjects are rated on the occupation and education scales, and these scale scores are then weighted, following a formula by Hollingshead (occupation = 7, education = 4). The weighted scale scores are then summed to-

gether. The result for each individual is a composite of the weighted scale scores, or an Index of Social Position Score. This final index can range from 77 (indicating a low socio-economic position) to 11 (indicating a high socio-economic position). SES scores were rated for each patient by a psychology graduate student. This student rated patients for premorbid occupation and education levels. The data for the ratings were gathered from each patient's clinical folder. The score of the rater for each patient was considered his SES score.

Observations

Each S was observed on the closed ward for a series of ten observation sessions. The observations were ten minutes in duration (see Harmatz et al., 1969). All observations were performed during a ten week interval. Observations were randomized for (1.) subjects, (2.) weeks, (3.) days of the week, (4.) hours of the day, (5.) hospital wards, and (6.) observers.

During each observation period, the experimenter observed a S, and simultaneously recorded all of the S's behavior using the Esterline recorder and operating panel apparatus. To avoid any observer bias during these observation periods, observers had no knowledge as to which of the Ss were members of the long-term and which of the Ss were members of the short-term group.

Data Analysis

The data were in the form of the sum of the time, frequency, and complexity scores of the ten observations for each S (see Results). The first four hypotheses concerned the time and frequency data for the four Behavior Classes. While additional analyses were also included using the complexity (average time) data, these complexity analyses were not considered to be tests of the four hypotheses.

Analyses of variance, profile analyses and t-tests were also performed using the time, frequency and complexity data of the 12 Behavioral Categories. Here an attempt was made to see which Categories, if any, helped to account for the differences between the long-term and the short-term groups.

RESULTS

Matching of Groups

Long and short-term groups were matched on several criteria, including diagnosis of schizophrenia and absence of organic pathology. These two criteria were satisfied by examination of hospital records. The quantitative criteria for matching long-term and short-term groups were age, age of onset, socio-economic status; as measured by the Hollingshead (1965) Two-Factor Index of Social Position, and severity of illness at admission; as measured by the Baker-Thorpe (1956) rating scale. Table 1 presents the means and standard deviations for the age and age of onset data. T-tests were computed across both length of hospitalization groups, and show that there is no significant difference between the means of the groups for either of these two criteria. Further, with the matching of the groups on both age and age of onset, the groups are thereby also matched on length of "illness".

In addition to matching on age and age of onset, the groups were also matched on socio-economic status and severity of illness on admission. The means and standard deviations for these data are presented in Table 2. T-tests were computed between the long-term and short-term groups, and show that there is no significant difference in either the socio-economic status scores or the severity of illness scores received by the two groups.

Table 1

Means and Standard Deviations in the matching of Long-term and Short-term patients (for each group, n= 21).

Criteria	Long-term patients	Short-term patients	t
Mean Age	45.01 yrs.	42.57 yrs.	1.77
S. D.	3.69	5.01	
Mean Age Onset	25.71 yrs.	27.19 yrs.	1.27
S.D.	3.88	3.46	

Table 2

Means and Standard Deviations in the matching of Long-term and Short-term patients (for each group, n= 21).

Criteria	Long-term patients	Short-term patients	t
Mean SES	68.28	67.28	0.55
S.D.	5.96	5.64	
Mean Severity	13.23	12.38	1.08
S.D.	2.87	2.03	

On the basis of the data in Tables 1 and 2, it may be concluded that the groups were adequately matched on the relevant variables selected.

Long-Term vs. Short-Term Patients

The data were composed of the sum of the ten observations for each subject. Both Behavior Category and Behavior Class data were analyzed.

Behavior Classes. The data for the first four hypotheses consisted of Behavior Class scores. There were three kinds of Behavior Class scores for each S. Time data consisted of the amount of time that a S spent engaging in the behaviors of the class. Frequency data consisted of the number of times that a S performed the behaviors of the class. Complexity data consisted of the average amount of time that a S spent engaging in the behaviors of the class. Complexity data was derived by dividing the sum of the durations of behavior class responses for a S by the total number of class occurrences for that S. Thus, the formula for the Complexity data are,

$$\text{COMPLEXITY} = \text{TIME} \div \text{FREQUENCY}$$

The data for Hypothesis 1 are presented in Tables 3, 4, 5, and 6. The means shown in Table 3 are for the time, frequency, and complexity data for the Social Behavior Class. The summary of the analysis of variance in Table 4 shows that short-term patients spent significantly greater ($F=5.48$, $df=1/40$, $p<.05$) amount of time engaged in Social Behavior than did long-

Table 3

Means and Standard Deviations for Social Behavior using time frequency, and complexity data, across the Long-term and Short-term groups.

Data	Long-term patients	Short-term patients
Time		
Mean	141.42	545.42
S. D.	162.37	715.31
Frequency		
Mean	12.85	28.72
S. D.	13.93	17.72
Complexity		
Mean	10.24	30.91
S. D.	6.63	72.78

Table 4

Analysis of Variance of Social Behaviors using time data for the Long-term and Short-term groups.

Source	SS	df	MS	F
Length of Hos.	1548287.99	1	1548287.99	5.48*
Error	11298496.30	40	282462.40	
Total	12846784.29	41		

*$p < .05$

Table 5

Analysis of Variance of Social Behaviors using frequency data for the Long-term and Short-term groups.

Source	SS	df	MS	F
Length of Hos.	2640.21	1	2640.21	9.89***
Error	10668.87	40	266.72	
Total	13309.08	41		

***$p < .005$

Table 6

Analysis of Variance of Social Behaviors using complexity data for the Long-term and Short-term groups.

Source	SS	df	MS	F
Length of Hos.	4484.46	1	4484.46	1.59
Error	112138.36	40	2803.45	
Total	116622.82	41		

term patients. Further, Table 5 shows that short-term patients performed Social Behaviors significantly ($F=9.89$, $df=1/40$, $p<.005$) more frequently than did long-term patients. However, Table 6 indicates that there was no significant difference between long-term and short-term patients in the amount of average time spent performing Social Behaviors. Hypothesis 1 is supported by the above findings.

Tables 7, 8, 9, and 10 present the data for Hypothesis 2. The means in Table 7 are for all three kinds of Functional Class data. The analysis of variance for time data appears in Table 8. Here it can be seen that short-term patients spent significantly more time ($F=6.11$, $df=1/40$, $p<.05$) performing Functional Behaviors than did long-term patients. Table 9 indicates that short-term patients also performed Functional Behaviors with a significantly greater frequency ($F=6.19$, $df=1/40$, $p<.05$) than did long-term patients. Thus, Hypothesis 2 is supported. It can also be seen from Table 10 that short-term patients and long-term patients did not significantly differ in the amount of average time spent in performing Functional Behaviors.

Table 11 presents the means of the Null Behavior Class for Hypothesis 3. The analysis of variance of Null Behavior using the time data is shown in Table 12. Inspection of the Table indicates that long-term patients spent significantly more time ($F=10.50$, $df=1/40$, $p<.005$) performing Null Behaviors than did short-term patients. Table 13 shows that long-

Table 7

Means and Standard Deviations for the Functional Behavior using time, frequency and complexity data, across the Long-term and Short-term groups.

Data	Long-term patients	Short-term patients
Time		
Mean	1395.66	2679.19
S. D.	1496.80	1793.64
Frequency		
Mean	9.38	16.38
S. D.	8.83	8.94
Complexity		
Mean	131.64	167.91
S. D.	94.22	112.88

Table 8

Analysis of Variance of Functional Behaviors using time data for the Long-term and Short-term groups.

Source	SS	df	MS	F
Length of Hos.	17271106.88	1	17271106.88	6.11*
Error	112926867.91	40	2823171.69	
Total	130197974.79	41		

*$p < .05$

Table 9

Analysis of Variance of Functional Behaviors using Frequency data for the Long-term and Short-term groups.

Source	SS	df	MS	F
Length of Hos.	514.49	1	514.49	6.19*
Error	3319.92	40	82.99	
Total	3834.41	41		

*$p < .05$

Table 10

Analysis of Variance of Functional Behaviors using complexity data for the Long-term and Short-term groups.

Source	SS	df	MS	F
Length of Hos.	13812.51	1	13812.51	1.21
Error	453903.54	40	11347.58	
Total	467716.05	41		

Table 11

Means and Standard Deviations for Null Behavior using time, frequency and complexity data, across the Long-term and Short-term groups.

Data	Long-term patients	Short-term patients
Time		
Mean	3580.85	2024.09
S. D.	1568.25	1468.16
Frequency		
Mean	32.23	23.90
S. D.	12.05	12.24
Complexity		
Mean	115.52	86.51
S. D.	52.45	49.91

Table 12

Analysis of Variance of Null Behaviors using time data for the Long-term and Short-term groups.

Source	SS	df	MS	F
Length of Hos.	25446830.09	1	25446830.09	10.50***
Error	96912202.39	40	2422805.05	
Total	122359032.48	41		

***$p < .005$

Table 13

Analysis of Variance of Null Behaviors using frequency data for the Long-term and Short-term groups.

Source	SS	df	M.S	F
Length of Hos.	729.17	1	729.17	4.71*
Error	6183.62	40	154.59	
Total	6912.79	41		

*$p < .05$

Table 14

Analysis of Variance of Null Behaviors using complexity data for the Long-term and Short-term groups.

Source	SS	df	MS	F
Length of Hos.	8837.45	1	8837.45	3.21
Error	110099.34	40	2752.48	
Total	118936.79	41		

Table 15

Means and Standard Deviations for Pathological Behavior using time, frequency and complexity data, across the Long-term and Short-term groups.

Data	Long-term patients	Short-term patients
Time		
Mean	276.71	60.38
S. D.	612.89	110.60
Frequency		
Mean	14.28	5.19
S. D.	15.67	7.42
Complexity		
Mean	12.13	5.37
S. D.	19.57	7.52

Table 16

Analysis of Variance of Pathological Behaviors using time data for the Long-term and Short-term groups.

Source	SS	df	MS	F
Length of Hos.	491401.16	1	491401.16	2.41
Error	8145373.25	40	203634.33	
Total	863774.41	41		

Table 17

Analysis of Variance of Pathological Behaviors using frequency data for the Long-term and Short-term groups.

Source	SS	df	MS	F
Length of Hos.	868.59	1	868.59	5.50*
Error	6313.53	40	157.83	
Total	7182.12	41		

*$p < .05$

Table 18

Analysis of Variance of Pathological Behaviors using complexity data for the Long-term and Short-term groups.

Source	SS	df	MS	F
Length of Hos.	480.22	1	480.22	2.08
Error	9228.36	40	230.70	
Total	9708.58	41		

term patients had a significantly ($F=4.71$, $df=1/40$, $p<.05$) greater frequency of Null Behaviors than short-term patients, but Table 14 indicates that long-term patients did not differ from short-term patients in the amount of average time spent in performing Null Behaviors. Hypothesis 3 is supported by these findings.

The data for Hypothesis 4 is shown in Tables 15, 16, 17, and 18. Table 15 presents the means for the Pathological Behavior Class. Table 16 shows the results of the analysis of variance on the time data for this Behavior Class. Inspection of Table 16 indicates that there was no significant difference in the amount of time that short-term and long-term patients spent performing Pathological Behaviors. Table 18 suggests that long-term patients and short-term patients did not significantly differ in the amount of average time that they spent performing Pathological Behaviors. However, Hyoothesis 4 is partially supported by the results shown in Table 17. Here it can be seen that long-term patients did have a significantly ($F=5.50$, $df=1/40$, $p<.05$) greater frequency of Pathological Behaviors than did short-term patients.

Behavioral Categories. The 12 Behavioral Categories were also analyzed in order to assess which of them would differentiate the long-term and short-term groups. The scores were composed of sums of the ten observations for each S, and were of 3 types: time, frequency, and complexity data (see above).

Table 19 presents the means and standard deviations for the 12 Behavioral Categories, using time data, for the long-

Table 19

Means and Standard Deviations for the 12 Behavior Categories using time data, across the Long-term and Short-term groups.

Category	Long-term	Short-term	t
Pacing			
Mean	576.90	605.85	0.01
S. D.	696.45	993.01	
Non-Involvement			
Mean	3317.90	1953.57	2.86**
S. D.	1546.81	1444.92	
Self-Stimulatory			
Mean	263.04	70.52	1.45
S. D.	582.14	105.53	
Passive Entertainment			
Mean	1002.28	1705.85	1.80
S. D.	1303.63	1153.54	
Verbal I			
Mean	73.80	337.09	1.92
S. D.	97.28	603.89	
Atavistic			
Mean	39.80	1.80	1.12
S. D.	153.22	5.89	
Bizarre			
Mean	236.90	58.57	1.64
S. D.	473.43	105.63	
Non-Classificatory			
Mean	6.61	18.47	1.64
S. D.	20.08	36.36	
Reinforcement			
Mean	11.14	15.14	0.43
S. D.	23.45	33.67	
Verbal II			
Mean	58.47	166.52	1.74
S. D.	91.42	260.94	
Active Entertainment			
Mean	394.38	973.33	1.76
S. D.	786.67	1237.89	
NonVerbal Interpersonal			
Mean	9.14	21.80	1.28
S. D.	12.65	42.16	

**$p < .01$

term and short-term groups. Although many of the means for the categories seem to differ from each other across the length of hospitalization groups, the variability within these groups is also large. T-tests calculated for each of the categories indicate that the long-term and short-term patients differed significantly only for the Non-Involvement Category. Inspection of Table 19 indicates that long-term patients spent significantly more time ($t=2.86$, $df=40$, $p<.01$) engaged in Non-Involvement Behaviors than did short-term patients.

Table 20 shows the means and standard deviations of the categories using frequency data. Again, there would seem to be a lot of variability within the groups for each category. T-tests which were performed for each of the categories using these data show that the long-term and short-term groups differed significantly on the Passive Entertainment, Verbal I, and Bizarre Categories. Table 20 shows that short-term patients performed behaviors of the Passive Entertainment Category significantly ($t=2.12$, $df=40$, $p<.05$) more frequently than did long-term patients, while long-term patients more frequently ($t=2.31$, $df=40$, $p<.05$) engaged in Bizarre Behaviors than did short-term patients. It was also found that short-term patients engaged in Verbal I Behaviors significantly more frequently ($t=2.88$, $df=40$, $p<.01$) than did long-term patients.

Table 21 gives the means and standard deviations for the 12 Behavioral Categories using complexity data. T-tests

Table 20

Means and Standard Deviations for the 12 Behavior Categories using frequency data, across the Long-term and Short-term groups.

Category	Long-term	Short-term	t
Pacing			
Mean	9.47	8.14	0.18
S. D.	6.59	7.79	
Non-Involvement			
Mean	24.04	18.00	1.95
S. D.	9.49	10.22	
Self-Stimulatory			
Mean	8.19	5.90	1.65
S. D.	4.46	4.17	
Passive Entertainment			
Mean	7.95	13.71	2.12*
S. D.	8.52	8.75	
Verbal I			
Mean	7.23	16.76	2.88**
S. D.	9.05	11.70	
Atavistic			
Mean	2.61	0.28	1.28
S.D.	8.08	0.70	
Bizarre			
Mean	11.66	4.90	2.31*
S. D.	11.05	6.94	
Non-Classificatory			
Mean	0.23	0.42	1.18
S. D.	0.52	0.73	
Reinforcement			
Mean	0.57	0.42	0.44
S. D.	1.17	0.73	
Verbal II			
Mean	4.23	8.28	1.99
S. D.	5.20	7.42	
Active Entertainment			
Mean	1.42	2.66	1.47
S. D.	2.54	2.77	
NonVerbal Interpersoanl			
Mena	1.38	3.66	1.63
S. .D	1.70	6.03	

*$p \leq .05$, **$p \leq .01$

Table 21

Means and Standard Deviations for the 12 Behavior Categories using complexity data, across the Long-term and Short-term groups.

Category	Long-term	Short-term	t
Pacing			
Mean	60.01	59.01	0.00
S. D.	55.41	52.38	
Non-Involvement			
Mean	139.00	109.32	1.58
S. D.	56.10	61.03	
Self-Stimulatory			
Mean	31.36	9.33	1.86
S. D.	51.46	11.24	
Passive Entertainment			
Mean	105.49	150.51	1.36
S. D.	87.30	119.26	
Verbal I			
Mean	10.18	15.31	1.54
S. D.	8.23	13.36	
Atavistic			
Mean	1.80	0.95	0.22
S. D.	4.57	2.49	
Bizarre			
Mean	14.43	5.31	1.54
S. D.	25.31	7.61	
Non-Classificatory			
Mean	4.45	18.42	1.70
S. D.	11.47	36.36	
Reinforcement			
Mean	5.62	9.80	0.81
S. D.	10.34	20.52	
Verbal II			
Mean	9.06	15.61	1.44
S. D.	9.45	16.83	
Active Entertainment			
Mean	95.29	218.01	2.17*
S. D.	160.01	192.95	
NonVerbal Interpersonal			
Mean	4.14	4.60	0.26
S. D.	6.47	3.69	

*$p < .05$

calculated for each category reveal that only the Active Entertainment Category significantly differentiated between the long-term and short-term groups. It was found that short-term patients spent significantly ($t=2.17$, $df=40$, $p<.05$) more average time performing Active Entertainment Behaviors than did long-term patients.

The data for Hypothesis 5 involved the use of the technique of profile analysis for both Behavior Category and Behavior Class data. Using the techniques of Cronbach and Gleser (1953), time data for the 4 Behavior Classes and for the 12 Behavior Categories were analyzed. Again, the data for each profile analysis were in the form of the sum of the 10 observations for each S.

Behavior Categories. For the profile analysis of the Behavior Categories, the time data scores for each category of a S were subtracted from the time data of that category for a second S. The difference between the 2 Ss for the category was then squared. This procedure was followed for every category for the 2 Ss, and the sum of the squared differences was computed. The formula for this procedure for any 2 Ss is, then,

$$\sum_{j=1}^{k} (Xj_1 - Xj_2)^2 \quad ;$$

where j=1 . . . k, categories; and 1 and 2 are Ss. The square root of this sum of squared differences was then taken, with the result called "d", or the "difference" between any 2 Ss on the 12-dimensional (category) space. The "d's" were found for

all of the 42 Ss in the sample. Thus, each S was compared with every other S in the study, resulting in a matrix of 1764 "d's". Following the method used by Sawrey, Keller, and Conger (1960), limits were then chosen which would allow a reasonable grouping of the "d's" for the Ss. The limits were derived first by summing the standard deviations for each of the 12 Behavior Categories. The limits were then multiplied by 3/4, 2/3, 1/2, 1/3 and 1/4. The result of these multiplications was to progressively decrease the limits, and thus, to allow a smaller, more cohesive sample of "d's" to be grouped. An example of the formula used to find the limits is the following:

$$\text{Limit}=3/4 \sum_{j=1}^{k} (Sj);$$ where j=1 . . k, categories; and Sj= the standard deviation for the category j. The limits derived from the above technique can be found in Table 22.

When the profile analysis was complete, and the limits derived, a search of the 1764 "d" matrix was undertaken, and two groups were found. Group I, or the "pure short-term" group, was composed of those short-term Ss whose "d's" did not exceed the lowest limit, or 1624.86. Accordingly, Group II, or the "pure long-term" group, was composed of those long-term Ss whose "d's" also did not exceed this limit. The result was thus two "pure" groups based on the 12 categories (see Table 23). Analyses were then performed on these 2 "pure" category groups.

Table 22

Limits for the Profile Analysis of the 12 Behavior Categories using time data, for the Long-term and Short-term patients.

$$\text{Limit} = \sum_{j}^{k} (sj) = 6499.45,$$ where j= 1,...k; categories, and

sj= the standard deviation of category "j".

Limit (1) = 3/4 (Limit) = 4874.58

Limit (2) = 2/3 (Limit) = 4332.96

Limit (3) = 1/2 (Limit) = 3249.72

Limit (4) = 1/3 (Limit) = 2166.86

Limit (5) = 1/4 (Limit) = 1624.86

Table 23

"Pure Short-term" and "Pure Long-term" groups derived from the Profile Analysis of the 12 Behavior Categories, using time data.

"Pure Short-term" patients.	"Pure Long-term" patients.
#5	#23
#9	#34
#17	#37
#18	
#20	

Table 24 presents the means and standard deviations for the 12 Behavior Categories using time data across the "pure short-term" and the "pure long-term" groups. Inspection of this table indicates that the "pure long-term" patients spent the largest amount of their observed time engaged in Non-Involvement Behaviors (n=3, mean=3441.66), while the "pure short-term" patients spent the largest amount of their observed time performing Passive Entertainment Behaviors (n=6, mean=2625.33). Further, the "pure long-term" patients spent the next largest amount of their observed time engaged in Pacing Behaviors (n=3, mean=1431.00), while the "pure short-term" patients spent the next largest amount of their observed time performing Active Entertainment Behaviors (n=6, mean=1543.33). T-tests calculated for each of the behavior categories reveal that the "pure short-term" and the "pure long-term" patients differ significantly on seven of the twelve Behavior Categories. Table 24 shows that "pure short-term" patients spent significantly more time ($t=10.63$, $df=7$, $p<.001$) in Passive Entertainment Behaviors than the "pure long-term" patients, while the "pure long-term" patients spent significantly more time ($t=4.72$, $df=7$, $p<.01$) performing Pacing Behaviors than the "pure short-term" patients. It can also be seen that the "pure short-term" patients spent significantly more time engaged in Verbal I ($t=3.06$, $df=7$, $p<.05$) and Active Entertainment Behaviors ($t=6.71$, $df=7$, $p<.001$) than did the "pure long-term" patients; while the "pure long-term" patients spent significantly more time performing Non-Involvement ($t=7.22$,

Table 24

Means and Standard Deviations for the 12 Behavior Categories using time data, for the "Pure Short-term" and "Pure Long-term" groups (n= 9).

Category	"Pure Short-term"	"Pure Long-term"	t
Pacing			
Mean	239.50	1431.00	4.72**
S. D.	268.98	390.59	
Non-Involvement			
Mean	1219.83	3441.66	7.22***
S. D.	279.65	541.99	
Self-Stimulatory			
Mean	27.50	235.33	3.57**
S. D.	12.93	125.60	
Passive Entertainment			
Mean	2625.83	247.33	10.63***
S. D.	320.54	180.41	
Verbal I			
Mean	258.00	14.66	3.06*
S. D.	122.06	13.70	
Atavistic			
Mean	0.33	0.66	0.52
S. D.	0.74	0.94	
Bizarre			
Mean	8.00	442.33	2.51*
S. D.	12.05	377.08	
Non-Classificatory			
Mean	0.00	0.00	0.00
S. D.	0.00	0.00	
Reinforcement			
Mean	22.00	0.00	0.74
S. D.	45.28	0.00	
Verbal II			
Mean	60.33	114.66	0.69
S. D.	42.18	158.64	
Active Entertainment			
Mean	1543.83	0.66	6.71***
S. D.	354.52	0.94	
NonVerbal Interpersonal			
Mean	19.66	16.66	0.16
S. D.	23.80	21.48	

*$p < .05$
**$p < .01$
***$p < .001$

df=7, p .001), Self-Stimulatory (t=3.57, df=7, p<.01) and Bizarre (t=2.51, df=7, p<.05) Behaviors than did the "pure short-term" patients.

Behavior Classes. The profile analysis for the four Behavior Classes was performed using the same procedure as those outlined for the profile analysis of the 12 Behavior Categories. In the behavior class profile analysis, however, the derived "d's" represented the differences between pairs of Ss on a four-dimensional (class) space. After all the "d's" were derived, limits were again computed. Table 25 presents these limits. Using the limits shown in Table 25, a search was made on the matrix of "d's" for all Ss, and 2 groups were found. Group I, or the "pure short-term" group, was composed of those short-term Ss whose "d's" did not exceed the lowest limit of 1118.51. Similarly, Group II, or the "pure long-term" group, was composed of those long-term Ss whose "d's" also did not exceed this limit. The result was 2 "pure" groups based on the 4 Behavior Classes (see Table 26). Analyses were then performed on the 2 "pure" class groups.

Table 27 presents the means and the standard deviations for the 4 Behavior Classes using time data across the "pure short-term" and "pure long-term" groups. Here it can be seen that the patients of the "pure long-term" group spent the largest amount of their observed time engaged in Null Behaviors (n=4, mean=2913.75), and the next largest amount of their observed time engaged in Functional Behaviors (mean=2890.00). The opposite seems to be the case with the "pure short-term"

Table 25

Limits for the Profile Analysis of the 4 Behavior Classes using time data, for the Long-term and Short-term patients.

$$\text{Limit} = \sum_{j}^{k} (sj) = 4474.05,$$ where j= 1...k; Classes, and

sj = standard deviation of Class "j".

Limit (1) = 3/4 (Limit) = 3355.53

Limit (2) = 2/3 (Limit) = 2982.70

Limit (3) = 1/2 (Limit) = 2237.02

Limit (4) = 1/3 (Limit) = 1491.35

Limit (5) = 1/4 (Limit) = 1118.51

Table 26

"Pure Short-term" and "Pure Long-term" groups derived from the Profile Analysis of the 4 Behavior Classes, using time data.

"Pure Short-term" patients.	"Pure Long-term" patients.
#5	#24
#9	#26
#20	#36
	#39

Table 27

Means and Standard Deviations for the 4 Behavior Classes using time data, for the "Pure Short-term" and "Pure Long-term" groups (n= 7).

Class	"Pure Short-term"	"Pure Long-term"	t
Social			
Mean	389.00	293.00	0.59
S. D.	153.50	197.16	
Functional			
Mean	4030.33	2890.00	4.05*
S. D.	313.76	311.97	
Null			
Mean	1067.00	2913.75	3.43*
S. D.	232.98	351.27	
Pathological			
Mean	12.00	175.00	1.26
S. D.	15.57	189.06	

*$p < .05$

patients, who spent the largest amount of their observed time engaged in Functional Behaviors (n=3, mean=4030.33) and the next largest amount of their observed time performing Null Behaviors (mean=1067.00). Along this line, t-tests performed for each of the Behavioral Classes reveal that the "pure long-term" patients spent significantly ($t=3.43$, $df=5$, $p<.05$) more time performing Null Behaviors than did the "pure short-term" patients; while the "pure short-term" patients spent significantly ($t=4.05$, $df=7$, $p<.05$) more time performing Functional Behaviors than did the "pure long-term" patients.

Differences Within the Short-Term Group

Subjects in the short-term hospitalization group were divided into 3 subgroups on the basis of the length of hospitalization of the Ss. Short-term Group 1 (ST1) was composed of patients who had been hospitalized for up to 4 months. Short-term Group 2 (ST2) was composed of patients who had been hospitalized for from 4 months to one year. Short-term Group 3 (ST3) was composed of patients who had been hospitalized for one year to two years. Again, the data were of three types: time, frequency, and complexity data. These data were compiled from the sum of the 10 observations for each of the short-term Ss.

Behavior Classes. Table 28 presents the means and standard deviations of the 4 Behavior Classes, using time data for the 3 short-term groups. Inspection of this table indicates

Table 28

Means and Standard Deviations of the 4 Behavior Classes using time data, for the Short-term groups (=21).

Class	ST1	ST2	ST3	F
Social				
Mean	843.71	390.28	342.28	0.99
S. D.	1111.99	291.33	245.89	
Functional				
Mean	1031.71	4312.14	2693.71	11.34****
S. D.	994.79	750.65	1648.48	
Null				
Mean	2843.14	935.28	2293.85	3.82*
S. D.	1685.41	471.35	1214.33	
Pathological				
Mean	118.28	9.00	53.85	1.77
S. D.	156.40	13.74	77.54	

*$p \leq .05$
****$p < .001$

Figure 1

Mean time in seconds of Functional Behavior by length of hospitalization

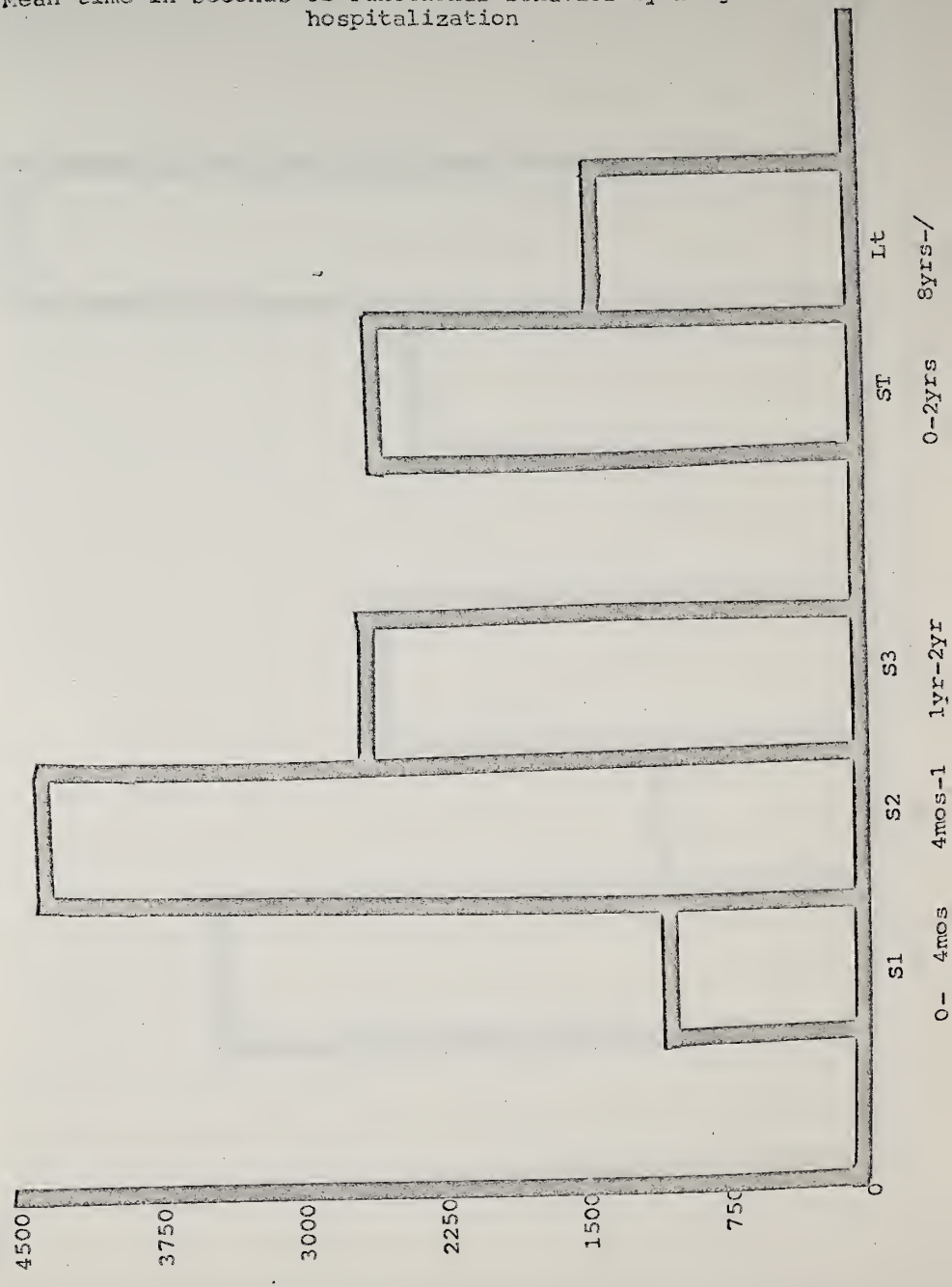
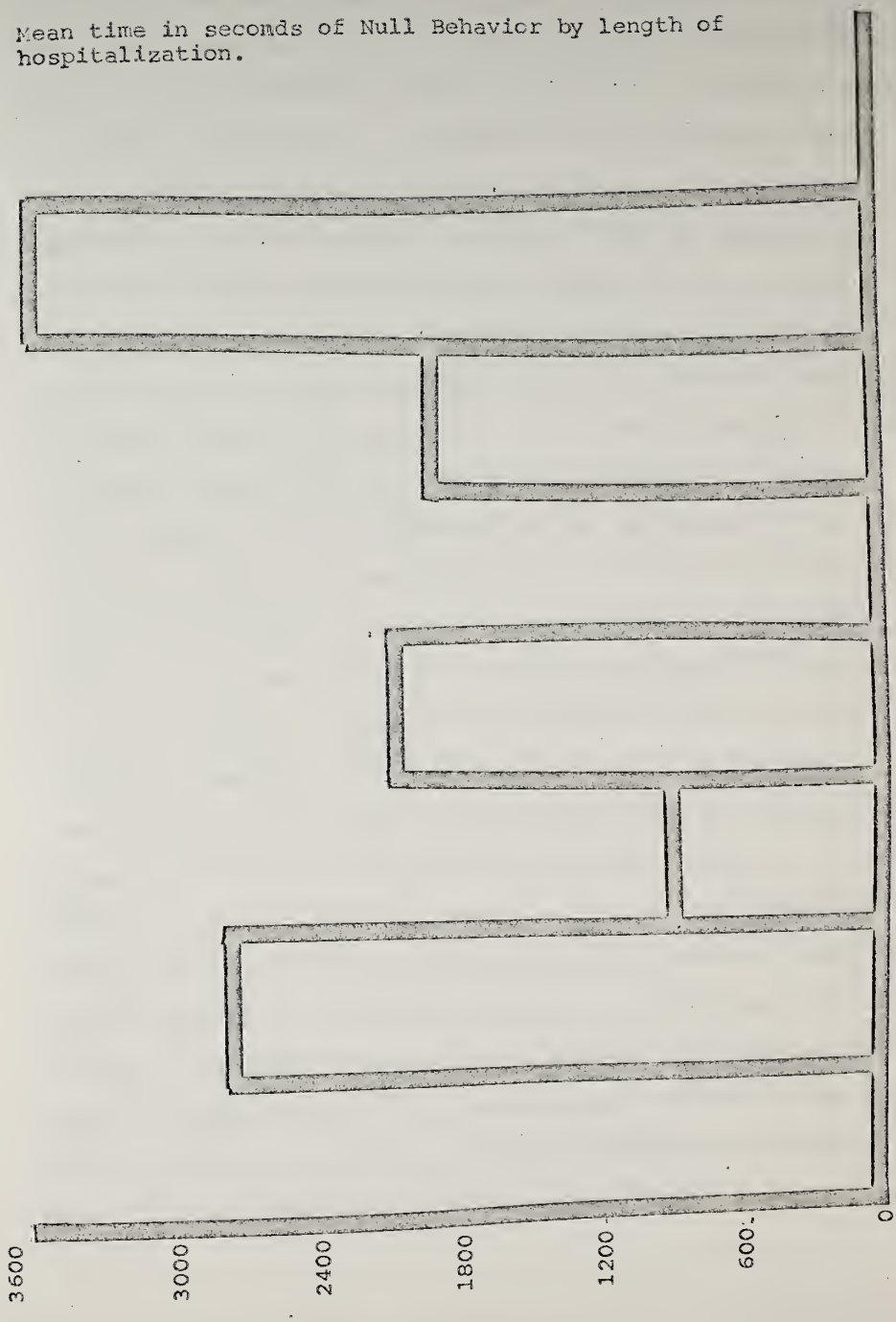


Figure 2

Mean time in seconds of Null Behavior by length of hospitalization.



that there was significantly different responding for both the Functional Behavior ($F=11.34$, $df=2/18$, $p<.001$) and the Null Behavior ($F=3.82$, $df=2/18$, $p<.05$) Classes for the time data over the 3 short-term groups. The Scheffé Test for Multiple Comparisons (Hays, 1963) was performed on the means for both the Functional time and the Null time data. For the Functional time data, none of the differences between the 3 group means were as large as the value of 6365.04 necessary for significance at the .05 level. However, when the average of the means for Groups 1 and 3 was compared with the mean of Group 2, the difference equaled 2449.44, which well exceeded the value of 303.99 necessary for significance at the .05 level. Thus, the difference between the mean of Group 2, and the other two group means is significant. Figure 1 presents these means in block-graph form. Inspection of the 3 short-term blocks of this figure, along with the results of the Scheffé's test performed on these data, confirms that the greatest amount of Functional time behavior occurred within short-term Group 2; the group of patients who had been hospitalized for from 4 months to 1 year. Similarly, for the Null time data, results of the Scheffé's test showed that none of the differences between the group means equaled 6457.21, the value necessary for significance at the .05 level. However, the difference between the average of the means for Groups 1 and 3 was significantly different from the mean for Group 2 ($d=1633.22$, critical value=274.57, $p<.05$). Figure 2 shows these means in block-graph form. The results

of this analysis indicate that there is significantly less Null Behavior within short-term Group 2. Thus, short-term Group 2 has been found to have spent more time performing Functional Behaviors and less time performing Null Behaviors than short-term Groups 1 and 3.

Table 29 shows the means and standard deviations of the 4 Behavior Classes, using frequency data, for the 3 short-term groups. This table also indicates significantly different responding for the Functional Behavior ($F=4.43$, $df=2/18$, $p<.05$) and Null Behavior ($F=5.09$, $df=2/18$, $p<.05$) Classes. Results of the Scheffé's test for the Functional Behavior Class data indicate that none of the differences between the individual means of the 3 short-term groups are significant (critical value=29.05). However, the average of the means for Groups 1 and 3 for this data is significantly different ($d=9.71$, critical value=7.79, $p<.05$) than the mean of Group 2. Figure 3 presents these means. Here it can be seen that short-term Group 2 had the greatest frequency of Functional Behavior responding. For the Null Behavior data, the Scheffé's test results also indicate that none of the differences between the individual group means were significant (critical value=52.06). Again, however, the difference between the mean of Group 2 and the average of the means of Groups 1 and 3 is significant ($d=14.43$, critical value=10.45, $p<.05$). Figure 4 confirms this finding, showing that short-term Group 2 had the lowest frequency of Null Behavior of the 3 short-term groups. Thus, the results show that

Table 29

Means and Standard Deviations of the 4 Behavior Classes using frequency data for the Short-term groups (n= 21).

Class	ST1	ST2	ST3	F
Social				
Mean	21.42	32.00	37.71	0.83
S. D.	18.07	10.37	20.69	
Functional				
Mean	10.28	22.85	16.00	4.43*
S. D.	7.38	8.69	5.28	
Null				
Mean	32.14	14.28	25.28	5.09*
S. D.	11.74	9.78	7.30	
Pathological				
Mean	7.42	2.14	6.00	0.89
S. D.	9.86	3.48	6.41	

*$p < .05$

Figure 3

Mean frequency of Functional Responses by length of hospitalization.

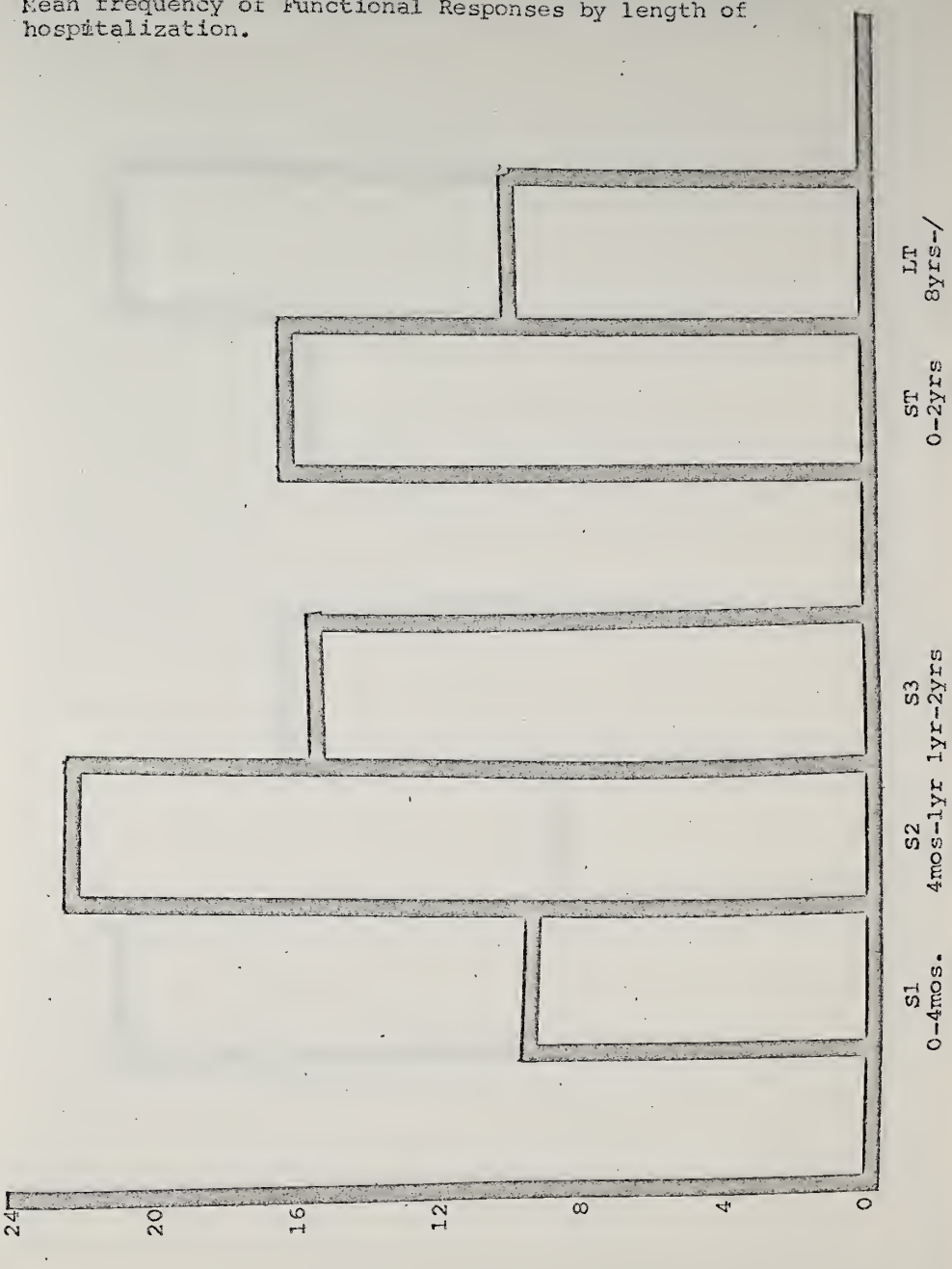
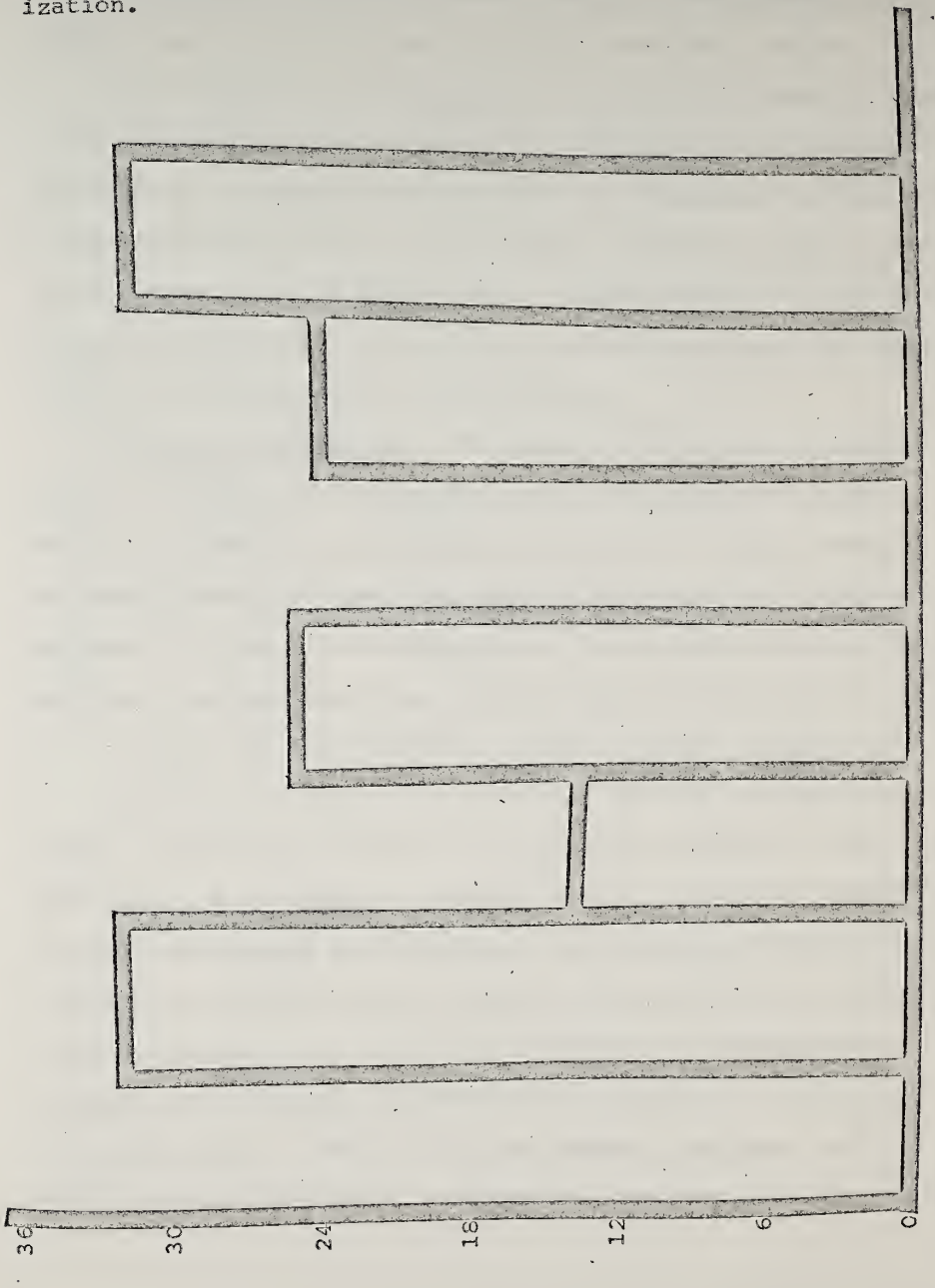


Figure 4

Mean frequency of Null Responses by length of hospitalization.



the patients in short-term Group 2 performed Functional Behaviors significantly more frequently and Null Behaviors significantly less frequently than the other short-term groups.

The means and standard deviations of the 4 Behavior Classes using complexity data for the short-term groups are presented in Table 30. Although there do seem to be inter-group differences between the means of the classes, the intra-group variability appears to be quite large. Consequently, no significant differences were found in the amount of average time spent performing the behaviors of the classes.

Behavior Categories. The means and standard deviations of the 12 Behavioral Categories using time data across the short-term groups, is presented in Table 31. Significantly different responding over the short-term groups was found for behaviors of the Non-Involvement and Passive Entertainment Categories. Further, the significant F ratio for the Non-Involvement Category ($F=3.73$, $df=2/18$, $p<.05$) probably accounts for the significant F ratio that was found for the Null Behavior Class using this data; while the highly significant F ratio for the Passive Entertainment Category ($F=8.70$, $df=2/18$, $p<.005$) probably determined the significant F ratio found for the Functional time behavior data. Those results have been presented above (see Table 22). The Scheffé's test for Multiple Comparisons was performed on the Non-Involvement and Passive Entertainment data. For the Non-Involvement time data, none of the differences between the individual means equaled the value

Table 30

Means and Standard Deviations of the 4 Behavior Classes using Complexity data, for the Short-term groups (n=21).

Class	ST1	ST2	ST3	F
Social				
Mean	70.35	10.86	11.53	1.54
S. D.	116.20	6.49	3.25	
Functional				
Mean	106.99	231.04	165.71	2.27
S. D.	67.45	136.41	85.80	
Null				
Mean	84.60	84.07	90.85	0.03
S. D.	37.34	65.80	41.51	
Pathological				
Mean	9.31	1.88	4.92	1.77
S. D.				

Table 31

Means and Standard Deviations of the 12 Behavior Categories using time data, for the Short-term groups(n=21).

Category	ST1	ST2	ST3	F
Pacing				
Mean	994.71	255.00	671.71	0.92
S. D.	1174.73	260.24	1111.51	
Non-Involvement				
Mean	2740.00	885.57	2235.14	3.73*
S. D.	1690.06	454.90	1166.97	
Self-Stimulatory				
Mean	103.14	49.71	58.71	0.46
S. D.	132.76	82.62	85.57	
Passive Entertainment				
Mean	829.85	2780.71	1507.00	8.70***
S. D.	840.26	866.76	748.08	
Verbal I				
Mean	549.71	235.28	226.28	0.59
S. D.	989.80	143.74	160.72	
Atavistic				
Mean	3.85	0.28	1.28	0.62
S. D.	9.45	0.70	2.76	
Bizarre				
Mean	114.42	8.71	52.57	1.82
S. D.	148.24	13.90	75.28	
Non-Classificatory				
Mean	36.14	8.42	10.71	1.21
S. D.	56.23	13.35	12.38	
Reinforcement				
Mean	26.00	18.85	0.57	1.01
S. D.	35.18	42.63	1.40	
Verbal II				
Mean	286.00	134.57	79.00	1.13
S. D.	368.10	209.25	44.99	
Active Entertainment				
Mean	201.85	1531.42	1186.71	2.35
S. D.	287.21	1462.92	1235.48	
NonVerbal Interpersonal				
Mean	8.00	20.42	37.00	0.77
S. D.	6.09	21.22	66.50	

*$p < .05$
***$p < .005$

of 6475.92 necessary for significance at the .05 level. However, the average of the means for short-term Groups 1 and 3 was significantly different (d=1602.00, critical value=412.68, $p<.05$) than the mean for short-term Group 2. Figure 5 shows these means in block-graph form. Here it can be seen that short-term Groups 1 and 3 spent significantly more time engaged in Non-Involvement Behavior than did short-term Group 2. For the Passive Entertainment time data, the Scheffe's test results also indicate that the differences between the individual group means were not significant (critical value=4389.56). Moreover, the difference between the average of the means for short-term Groups 1 and 3 was not significantly different than the mean of short-term Group 2. However, the average of the means for short-term Groups 2 and 3 was found to be significantly different (d=1314.00, critical value=877.67, $p<.05$) than the mean of short-term Group 1. Figure 6 presents these means. This data indicates that short-term Group 1 spent significantly less time engaged in Passive Entertainment Behavior than short-term Groups 2 and 3.

Table 32 presents the means and standard deviations of the 12 Behavioral Categories using frequency data across the short-term groups. Significantly different responding for the short-term groups was found for behaviors of the Non-Involvement Category ($F=7.14$, $df=2/18$, $p<.005$). Results of the Scheffé's test on these data indicate that the differences between the individual means were not significant (critical

Figure 5

Mean time in seconds of Non-Involvement Behavior by length of hospitalization.

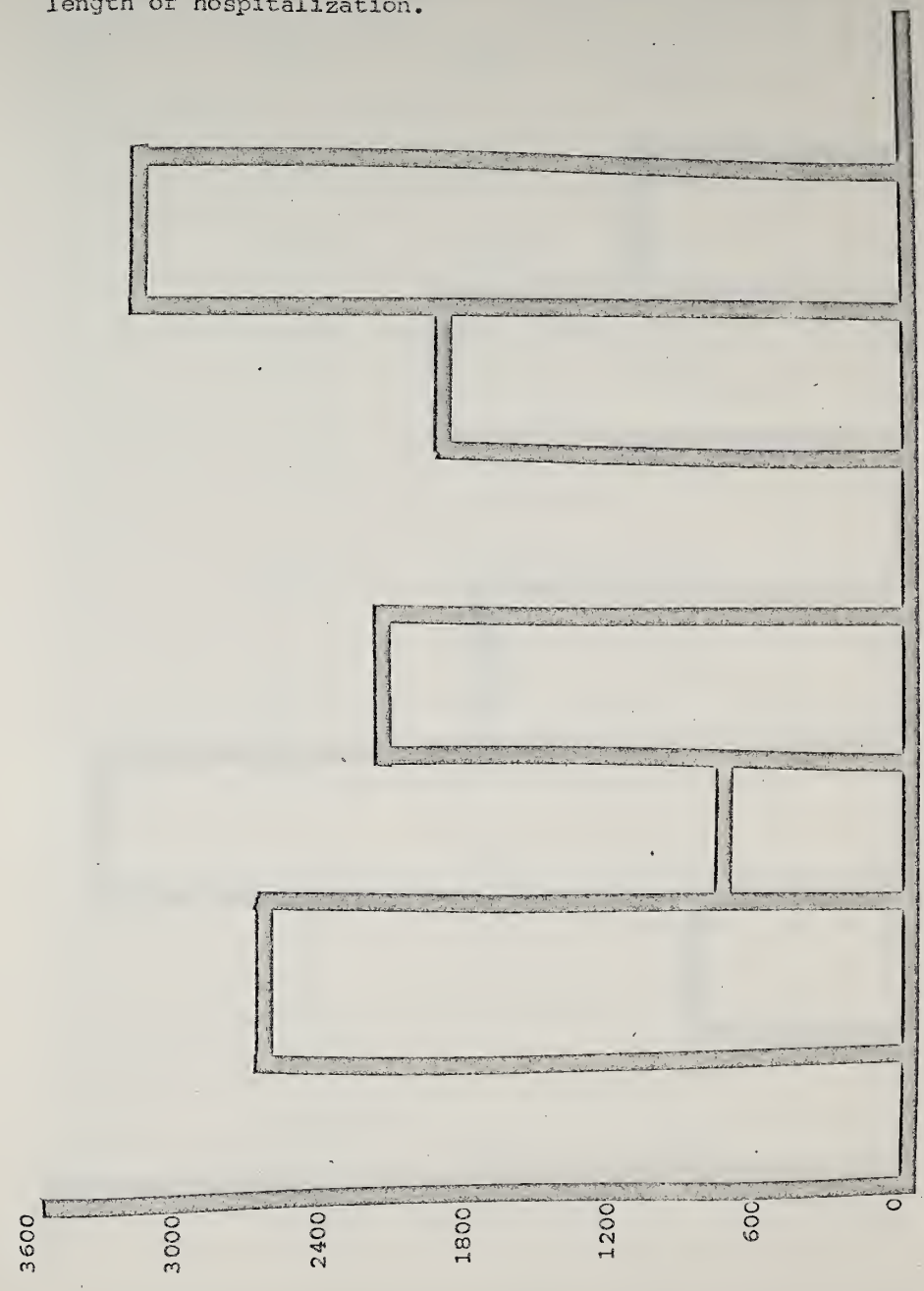


Figure 6

Mean time in seconds of Passive Entertainment Behavior by length of hospitalization.

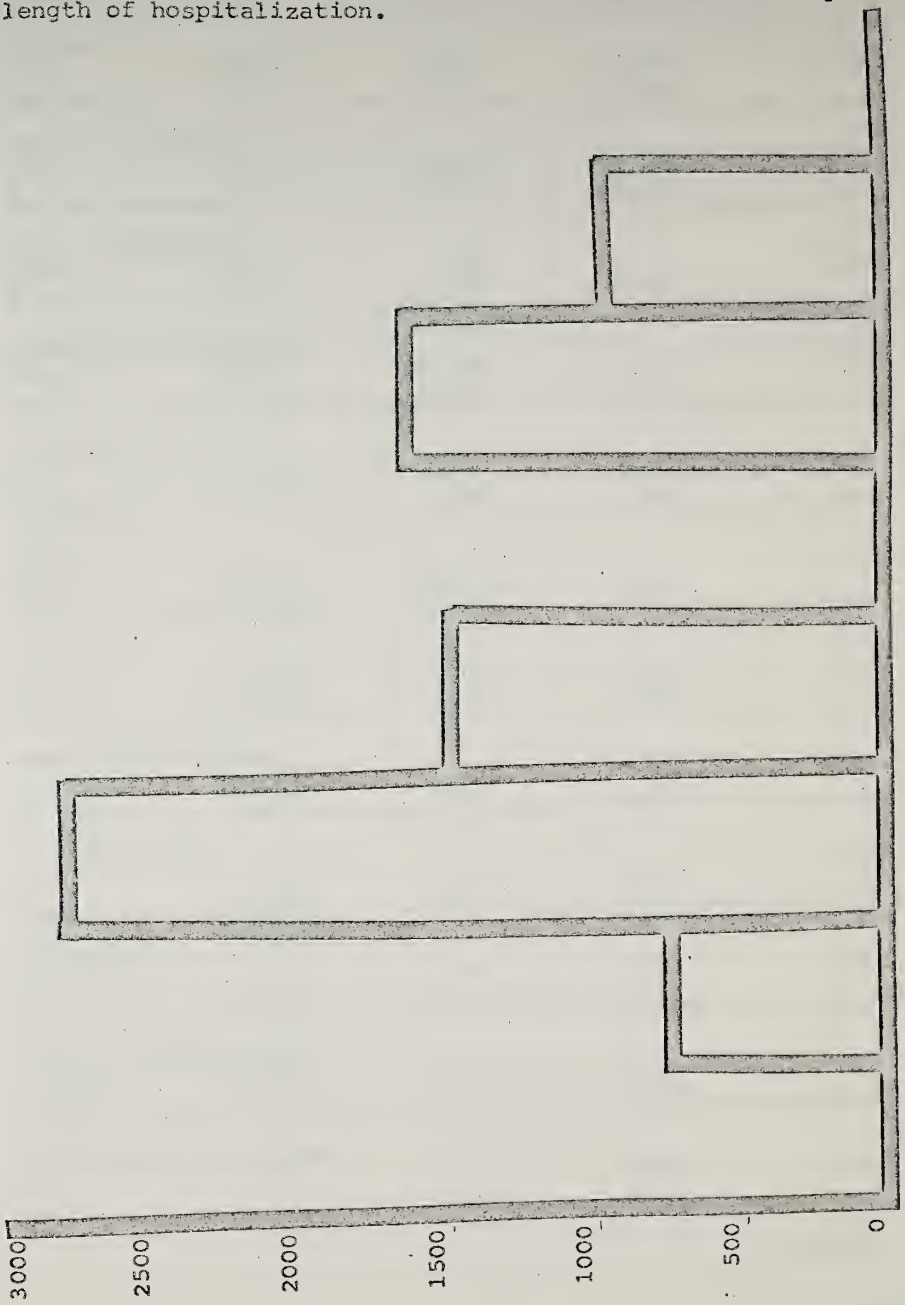


Table 32

Means and Standard Deviations of the 12 Behavior Categories using frequency data, for the Short-term groups (n=21).

Category	ST1	ST2	ST3	F
Pacing				
Mean	10.00	5.85	8.57	0.46
S. D.	7.96	3.53	9.86	
Non-Involvement				
Mean	24.42	9.00	19.57	7.14**
S. D.	9.87	5.97	6.48	
Self-Stimulatory				
Mean	6.71	5.28	5.71	0.18
S. D.	4.33	4.59	3.37	
Passive Entertainment				
Mean	9.42	19.00	12.71	2.33
S. D.	7.27	10.37	4.69	
Atavistic				
Mean	0.42	0.14	0.28	0.25
S. D.	1.05	0.36	0.45	
Verbal I				
Mean	12.57	21.42	16.28	0.95
S. D.	13.96	10.20	8.52	
Bizarre				
Mean	7.00	2.00	5.71	0.92
S. D.	8.87	3.54	6.29	
Non-Classificatory				
Mean	0.28	0.14	0.42	0.51
S. D.	0.50	0.45	0.50	
Reinforcement				
Mean	0.57	0.57	0.14	0.73
S. D.	0.72	0.90	0.36	
Verbal II				
Mean	7.28	7.71	9.85	0.21
S. D.	6.27	6.14	9.19	
Active Entertainment				
Mean	0.85	3.85	3.28	2.55
S. D.	1.13	2.59	3.15	
NonVerbal Interpersonal				
Mean	1.57	2.85	6.57	1.27
S. D.	1.17	1.89	9.51	

**p < .01

value=40.63), but that there was a significant difference (d=12.99, critical value=7.93, $p<.05$) between the mean of short-term Group 2 and the average of the means of short-term Groups 1 and 3. Figure 7 presents the means for these short-term groups. These results show that short-term Group 2 had the lowest frequency of Non-Involvement Behavior of the short-term groups.

Table 33 shows the means and standard deviations of the 12 Behavior Categories using complexity data for the short-term groups. No significant differences were found in the amount of average time spent parforming the behaviors of the categories.

Additional Analyses

Analyses were also performed in order to compare the patients of short-term Group 2 with the long-term patients. The data were in the form of the sum of the time and frequency scores for the 10 observations of each subject.

Behavior Classes. Appendix A presents the means and standard deviations for the four Behavior Classes using time data, across the long-term and the short-term Group 2 groups. T-tests calculated for each of the Behavior Classes reveal that the patients of short-term Group 2 spent significantly (t=2.72, df=26, $p<.05$) more time engaged in Social Behaviors than did the patients of the long-term group; while the patients of the long-term group spent significantly (t=4.26, df=26, $p<.001$) more time performing Null Behaviors than did

Figure 7

Mean frequency of Non-Involvement responses by length of hospitalization.

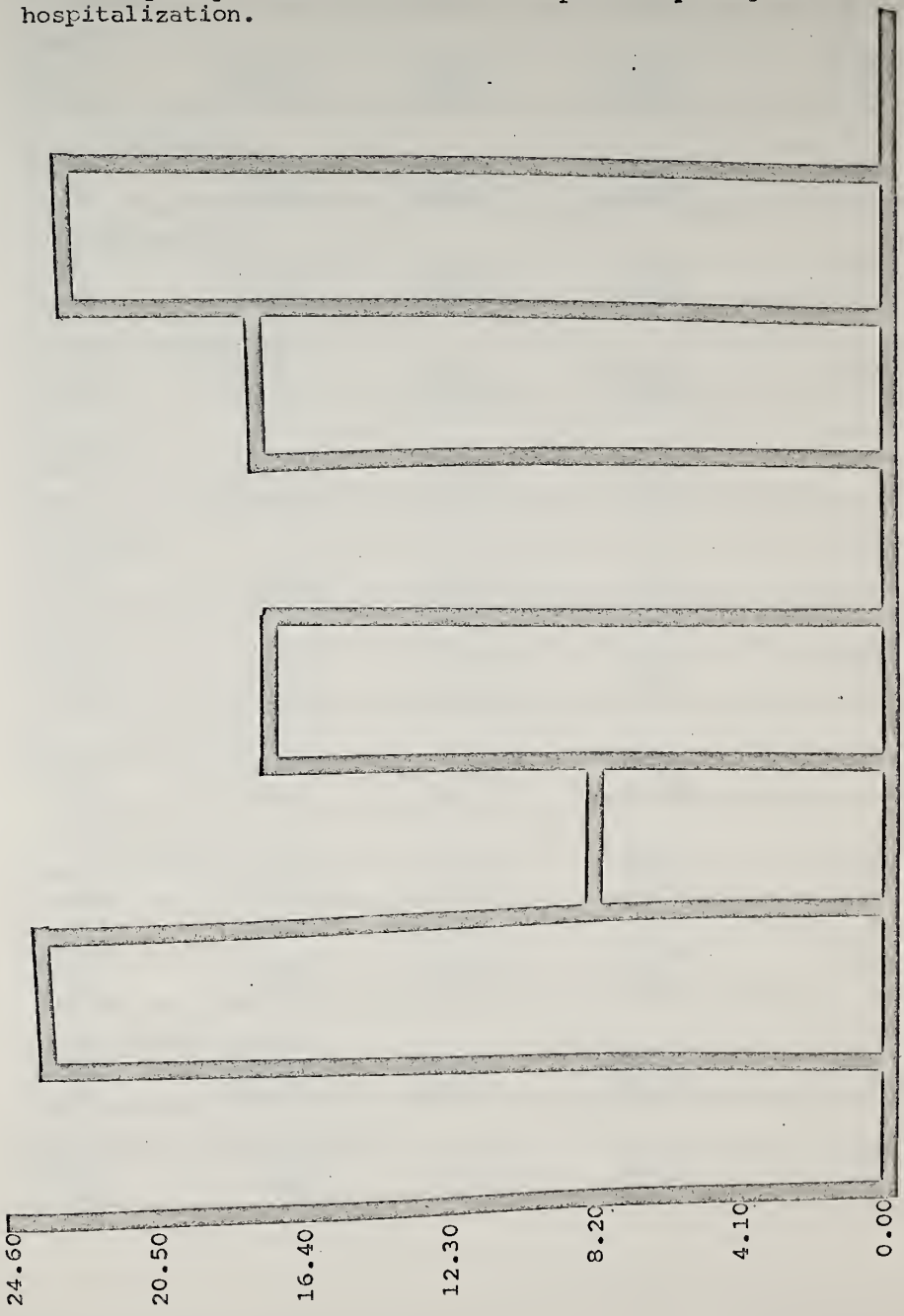


Table 33

Means and Standard Deviations of the 12 Behavior Categories using complexity data, for the Short-term groups (n=21).

Category	ST1	ST2	ST3	F
Pacing				
Mean	88.19	30.66	58.18	2.26
S. D.	66.36	22.96	38.86	
Non-Involvement				
Mean	102.17	113.78	112.02	0.06
S. D.	41.92	84.13	47.53	
Self-Stimulatory				
Mean	13.24	30.04	9.28	0.47
S. D.	13.24	65.80	11.97	
Passive Entertainment				
Mean	104.63	218.29	128.62	1.82
S. D.	66.16	161.62	70.64	
Verbal I				
Mean	24.27	10.76	11.78	2.40
S. D.	18.76	5.59	6.30	
Atavistic				
Mean	1.28	0.28	1.02	0.33
S. D.	3.15	0.36	2.76	
Bizarre				
Mean	9.42	1.60	4.98	1.92
S. D.	10.79	2.96	4.33	
Non-Classificatory				
Mean	36.00	9.42	10.71	1.47
S. D.	56.28	13.35	12.38	
Reinforcement				
Mean	19.42	9.42	0.57	1.47
S. D.	25.09	21.31	1.40	
Verbal II				
Mean	24.60	11.64	9.67	1.64
S. D.	23.34	11.25	6.87	
Active Entertainment				
Mean	92.15	345.53	223.64	3.44
S. D.	115.71	168.54	205.18	
NonVerbal Interpersonal				
Mean	3.64	5.37	4.78	0.35
S. D.	2.40	3.52	4.62	

the patients of short-term Group 2. Further, the results show that short-term Group 2 patients spent significantly ($t=4.87$, $df=26$, $p<.001$) more time engaged in Functional Behaviors than did long-term group patients. Thus, the results using the time data show that the patients of the short-term Group 2 differ significantly from the long-term group patients on 3 of the 4 Behavior Classes.

The means and standard deviations for the Behavior Classes using frequency data, across the long-term and short-term Group 2 groups can be found in Appendix B. The results of t-tests calculated between the classes are similar to the findings for the time data analyses. It can be seen that long-term patients performed Null Behaviors significantly ($t=3.46$, $df=26$, $p<.01$) more frequently than did short-term Group 2 patients. It can also be seen that short-term Group 2 patients performed Social ($t=3.23$, $df=26$, $p<.01$) and Functional ($t=3.40$, $df=26$, $p<.01$) Behaviors significantly more frequently than did long-term patients.

Behavior Categories. Appendix C presents the means and standard deviations for the 12 Behavior Categories using time data, across the long-term and short-term Group 2 groups. The results of t-tests performed between the categories show that long-term and short-term Group 2 patients differ significantly on 4 of the 12 Behavior Categories. Appendix C shows that the long-term patients spent significantly ($t=3.97$, $df=26$, $p<.001$) more time engaged in Non-Involvement Behaviors than did the

short-term Group 2 patients; while the short-term Group 2 patients spent significantly ($t=3.26$, $df=26$, $p<.01$) more time engaged in Passive Entertainment Behaviors than did the long-term patients. It can also be seen that the short-term Group 2 patients spent significantly more time in Verbal I ($t=3.23$, $df=26$, $p<.01$) and Active Entertainment Behaviors ($t=2.55$, $df=26$, $p<.05$) than did the long-term patients.

The means and standard deviations for the 12 Behavioral Categories using frequency data, across the long-term and short-term Group 2 groups are presented in Appendix D. Inspection of this table indicates that the long-term and short-term Group 2 patients differ significantly on five of the twelve Categories. It has been found that the short-term Group 2 patients performed Passive Entertainment ($t=2.71$, $df=26$, $p<.05$), Verbal I ($t=3.37$, $df=26$, $p<.01$), and Active Entertainment ($t=2.11$, $df=26$, $p<.05$) Behaviors significantly more frequently than did the long-term patients; while the long-term patients performed Non-Involvement ($t=3.82$, $df=26$, $p<.001$) and Bizarre ($t=2.20$, $df=26$, $p<.05$) Behaviors significantly more frequently than did the short-term Group 2 patients.

Severity of Illness

The data for the patients of short-term Group 1 were also further analyzed in order to determine the effects of severity of illness on ward behavior, with length of hospitalization controlled. ST 1 was chosen because these patients had been hos-

pitalized for a maximum of four months. The seven patients in ST 1 were divided into 2 subgroups on the basis of their scores on the Baker-Thorpe (1956) rating scale. Table 34 presents the severity scores of the patients in ST 1. The high severity group (SEV I) was composed of the 3 patients with severity scores above the median of 12. The low severity group (SEV II) was composed of the 4 patients with severity scores of 12 and below. Analyses were then performed on the data derived from the sum of the 10 observations of each subject for the 2 severity groups.

Behavior Class. The means and standard deviations for the Social Behavior Class using time, frequency, and complexity data across the severity groups, are shown in Table 35. The means and standard deviations for the Functional, Null, and Pathological Behavior Classes using time, frequency, and complexity data, are shown in Tables 36, 37, and 38 respectively. Inspection of these 4 tables indicates that no significant differences were found between the 2 severity groups for any of the Behavior Classes. This was found to be so using the time, frequency, and complexity data. Thus, no differences were found between the 2 severity groups in the performances of any of the behaviors of the 4 Behavior Classes.

Behavior Categories. Table 39 presents the means and standard deviations for the 12 Behavior Categories using time data across the 2 severity groups. No significant differences were found between the severity groups in the amount of time

Table 34

Severity of illness scores for the ST 1 group patients.

Patient	Severity Score
#6	18
#13	18
#7	16
#11	12
#15	12
#10	11
#4	10

Table 35

Means and Standard Deviations of the Social Behavior Class using time, frequency and complexity data, across severity groups (n=7).

Data	SEV I	SEV II	t
Time			
Mean	790.66	883.50	0.09
S. D.	610.85	1371.27	
Frequency			
Mean	23.00	20.25	-0.16
S. D.	16.08	19.33	
Complexity			
Mean	135.14	21.75	1.24
S. D.	153.14	23.04	

Table 36

Means and Standard Deviations for the Functional Behavior Class using time, frequency and complexity daya, across severity groups (n=7).

Data	SEV I	SEV II	t
Time			
Mean	563.33	1383.00	1.00
S. D.	355.33	1161.55	
Frequency			
Mean	5.66	13.75	1.45
S. D.	3.10	7.75	
Complexity			
Mean	112.44	102.91	0.15
S. D.	91.83	39.86	

Table 37

Means and Standard Deviations for the Null Behavior Class using time, frequency and complexity data, across severity groups (n=7).

Data	SEV I	SEV II	t
Time			
Mean	2459.66	3130.75	0.45
S. D.	1796.09	1535.77	
Frequency			
Mean	25.66	37.00	1.22
S. D.	6.62	12.38	
Complexity			
Mean	84.11	84.97	0.02
S. D.	47.78	26.96	

Table 38

Means and Standard Deviations for the Pathological Behavior Class using time, frequency and complexity data, across severity groups.

Data	SEV I	SEV II	t
Time			
Mean	116.00	120.00	0.02
S. D.	88.90	192.02	
Frequency			
Mean	5.33	9.00	0.42
S. D.	3.86	12.36	
Complexity			
Mean	15.16	4.93	1.20
S. D.	12.61	6.14	

Table 39

Means and Standard Deviations for the 12 Behavior Categories using time data, across severity groups (n=7).

Category	SEV I	SEV II	t
Pacing			
Mean	1897.00	318.00	2.00
S. D.	1300.78	278.25	
Non-Involvement			
Mean	2284.33	3081.75	0.53
S. D.	1795.16	1519.56	
Self-Stimulatory			
Mean	175.33	49.00	1.19
S. D.	175.39	30.58	
Passive Entertainment			
Mean	321.66	1211.00	1.36
S. D.	221.19	939.25	
Verbal I			
Mean	246.66	777.00	1.36
S. D.	181.32	1252.71	
Atavistic			
Mean	0.00	6.75	0.00
S. D.	0.00	11.69	
Bizarre			
Mean	116.00	113.25	0.02
S. D.	88.90	180.35	
Non-Classificatory			
Mean	23.00	46.00	0.46
S. D.	20.11	70.73	
Reinforcement			
Mean	52.66	6.00	1.95
S. D.	38.73	10.39	
Verbal II			
Mean	534.66	99.50	1.62
S. D.	436.42	113.56	
Active Entertainment			
Mean	241.66	172.00	0.37
S. D.	341.77	233.82	
NonVerbal Interpersonal			
Mean	9.33	7.00	0.43
S. D.	6.65	5.43	

spent performing the behaviors of the categories.

Table 40 shows the means and standard deviations for the 12 Categories using frequency data across the 2 severity groups. It can be seen that the patients of the high severity group (SEV I) performed Pacing Behaviors significantly ($t=3.39$, $df=5$, $p<.05$) more frequently than the patients of the low severity group (SEV II). No other differences were found in this data.

The means and standard deviations for the 12 Behavior Categories using complexity data across the 2 severity groups are found in Table 41. Inspection of the table indicates that there were no significant differences between the severity groups in the amount of average time spent in performing the behaviors of the categories.

Table 40

Means and Standard Deviations for the 12 Behavior Categories using frequency data, across severity groups (n=7).

Category	SEV I	SEV II	t
Pacing			
Mean	17.66	4.25	3.39*
S. D.	6.20	2.27	
Non-Involvement			
Mean	19.66	29.75	1.32
S. D.	7.33	9.28	
Self-Stimulatory			
Mean	6.00	7.25	0.32
S. D.	4.96	3.70	
Passive Entertainment			
Mean	4.66	13.00	1.55
S. D.	3.86	7.17	
Verbal I			
Mean	11.33	13.50	0.17
S. D.	7.72	17.16	
Atavistic			
Mean	0.00	0.75	0.00
S. D.	0.00	1.30	
Bizarre			
Mean	5.33	8.25	0.37
S. D.	3.86	11.09	
Non-Classificatory			
Mean	0.66	0.50	0.37
S. D.	0.47	0.50	
Reinforcement			
Mean	1.00	0.25	1.38
S. D.	0.81	0.43	
Verbal II			
Mean	10.00	5.25	0.90
S. D.	8.60	1.92	
Active Entertainment			
Mean	1.00	0.75	0.25
S. D.	1.41	0.83	
NonVerbal Interpersonal			
Mean	1.66	1.50	0.15
S. D.	1.25	1.11	

*$p < .05$

Table 41

Means and Standard Deviations for the 12 Behavior Categories using complexity data, across severity groups (n=7).

Category	SEV I	SEV II	t
Pacing			
Mean	91.39	84.78	0.29
S. D.	56.42	74.44	
Non-Involvement			
Mean	101.95	102.33	0.01
S. D.	50.54	34.07	
Self-Stimulatory			
Mean	23.05	5.88	1.88
S. D.	15.32	2.12	
Passive Entertainment			
Mean	112.02	99.08	0.21
S. D.	91.25	36.67	
Verbal I			
Mean	20.82	26.86	0.36
S. D.	1.45	24.47	
Atavistic			
Mean	0.00	2.25	0.00
S. D.	0.00	3.89	
Bizarre			
Mean	15.17	5.10	1.16
S. D.	12.61	6.43	
Non-Classificatory			
Mean	23.00	45.57	0.45
S. D.	20.11	70.84	
Reinforcement			
Mean	37.33	6.00	1.76
S. D.	27.63	10.39	
Verbal II			
Mean	36.78	15.46	1.13
S. D.	26.24	15.57	
Active Entertainment			
Mean	80.35	101.00	0.19
S. D.	113.63	116.46	
NonVerbal Interpersonal			
Mean	3.83	3.50	0.15
S. D.	2.78	2.06	

DISCUSSION

Long-Term - Short-Term Differences in Behavior

The general question to be answered in the first four hypotheses was whether or not long-term hospitalized schizophrenic patients differ from short-term hospitalized schizophrenic patients in the ward behaviors in which they engage. It was believed that long-term hospitalization would be associated with decreases in Social Behavior (Hypothesis 1) and Functional Behavior (Hypothesis 2). Further, it was suggested that long-term hospitalization would be related to increases in Null Behavior (Hypothesis 3) and Pathological Behavior (Hypothesis 4).

Hypothesis 1 received support in that short-term schizophrenic patients were found to spend significantly more time in performing Social Behaviors than long-term patients. It was also found that short-term patients performed Social Behaviors with a significantly greater frequency than did long-term patients. However, no difference was found between long-term patients and short-term patients in the amount of average time spent in performing Social Behaviors. Hypothesis 2 also received support. The findings showed that short-term patients spent significantly more time engaged in Functional Behaviors than long-term patients, and also that short-term patients performed Functional Behaviors significantly more frequently than long-term patients. No significant difference was found between the long-term and short-term groups in the amount of

average time spent performing Functional Behaviors. Hypothesis 3 concerned Null Behaviors. It was found that long-term patients spent significantly more time engaged in Null Behaviors than did short-term patients. It was also found that long-term patients performed Null Behaviors significantly more frequently than did short-term patients. These two findings supported the hypothesis. However, as with the first 2 hypotheses, no differences were found between the long-term patients and the short-term patients in the amount of average time in which Null Behaviors were performed. Hypothesis 4 received less support than the other three. It was found that long-term patients differed significantly from short-term patients only in the frequency with which they performed Pathological Behaviors. No significant differences were found between the long-term and the short-term patients in either the amount of time, or the amount of average time spent performing Pathological Behaviors.

In general, then, the first four hypotheses have been supported. Although the complexity data analyses were not considered to be tests of these four hypotheses, the failure to find significant differences between the long-term and the short-term patients using these data should also be considered. It has been suggested previously (see Results) that there was a good deal of variability in the performances of many observed behaviors within the long-term and the short-term groups. This variability can probably be attributed to the wide range

of hospitalized patients selected. Further, this variability probably accounts, in part, for the finding of no differences between the length of hospitalization groups, using the average time (complexity) data. A second possible explanation for this lack of average time differences can also be suggested. It has been indicated previously that the average time data may be a measure of the complexity of observed behavior. Further, others have suggested that the schizophrenic patient has, even prior to his hospitalization, a limited repertoire of appropriate complex social behaviors (Coyle and Coyle, 1965). Therefore, it can be reasoned that neither group of schizophrenic patients which was observed in the present study had a sufficient breadth of complex responses from which the effects of hospitalization could be distinguished. However, this finding of no significant differences between the length of hospitalization groups using the complexity data may also suggest that this complexity measure is not appropriate for observational research with hospitalized schizophrenic patients. Further research using behavioral complexity data is suggested in order to clarify this issue.

Implications of Results of Hypotheses 1-4. The findings indicate that, on an overall basis, long-term patients perform more Null and Pathological, and less Social and Functional Behaviors than do short-term patients. These findings are in support of the suggestions made by Meyerson (1939); Goffman (1961), and others (Rabin, King and Ehrmann, 1955; Ullmann

and Krasner, 1965) who have indicated that long-term hospitalization depresses various behaviors in the hospitalized patient. The reasoning of this writer has been that the more socially adaptive behaviors (Social Behaviors, Functional Behaviors) are not reinforced or even negatively reinforced on the hospital ward, and thus, that these kinds of behaviors tend to disappear. Further, it has been reasoned that behavior deficits (Null Behaviors) and inappropriate behaviors (Pathological Behaviors) tend to take the place of the more appropriate behaviors which have been lost due to the cumulative effects of hospitalization.

Support from studies in the area of Behavior Modification (Ayllon and Michael, 1959) suggest that ward personnel have at their disposal various methods of control over the behaviors of the hospitalized schizophrenic patient. Such methods of control involve the processes of reinforcement and nonreinforcement which have been mentioned above. However, it will also be noted that the control exercised by ward personnel is often haphazard and ineffective. For example, Gelfand, Gelfand and Dobson (1967) made behavioral observations on a hospital ward in order to determine whether the mental hospital staff provides effective reinforcement contingencies for the psychotic patient. Effective contingencies were defined as those where desirable behaviors were rewarded with attention, and psychotic and other undesirable behaviors were ignored, and thus, extinguished. The best "behavioral engineers" were

considered those persons who provided effective reinforcement contingencies for the patient. Since the people who usually respond to a patient's behaviors are either nurses, nursing assistants or other patients, these three groups were compared with respect to their skill as behavioral engineers. It was found that other patients exceeded both the nursing assistants and the nurses by ignoring inappropriate behavior 79% of the time and rewarding it only 12% of the time. Nursing assistants ignored 64% and rewarded 30% of the inappropriate behaviors, while nurses performed the most poorly by positively attending to inappropriate behavior 39% of the time. If such findings are reliable, the cumulative effects of the hospital environment on the already impoverished behavioral repertoire of the schizophrenic patient can readily be surmised. Moreover, the implications become obvious. Long-term hospitalization would often seem to be a poor choice of treatment for the schizophrenic patient. A reasonable alternative would appear to be behavioral training with the purpose of reestablishing an appropriate social repertoire. Such re-training would have to occur in some kind of community setting.

One final word about the implications of the first four hypotheses concerns a methodological question underlying the present study. The question which arises is whether the results presented above really do clarify what effects long-term hospitalization has on the schizophrenic patient. That is, is long-term hospitalization the cause of the behavioral

differences seen between the long-term and short-term patients, or is long-term hospitalization the result of the behaviors that have been observed? The answer to this question will be attempted later.

Hypothesis 5. Hypothesis 5 concerned the use of profile analysis on the Behavioral Category and Behavioral Class data, for the long-term and the short-term patients. Before discussing these findings, I will first consider the results of analyses performed for possible long-term - short-term differences of the Behavioral Categories.

Analyses for each of the 12 Behavioral Categories were performed for the time, frequency, and complexity data in order to see if the long-term patients differed from the short-term patients in their performances of any of the behaviors of the categories. Using time data, it was found that long-term patients spent significantly more time performing Non-Involvement Behaviors than did short-term patients. The findings using frequency data were that long-term patients performed Bizarre Behaviors significantly more frequently than did short-term patients, while short-term patients performed Passive Entertainment and Verbal I Behaviors significantly more frequently than did long-term patients. For the complexity data, the results showed that short-term patients spent significantly more average time performing Active Entertainment Behaviors than did long-term patients. Thus, for the 12 Behavioral Categories using the 3 kinds of observation data,

the results showed only 5 differences between the groups. To account for the small number of differences found, it must again be stressed that there was a good deal of intra-group variability in responding for many of the Behavior Categories. Thus, differences in the performance of many of the observed behaviors were not seen until these behaviors were summed into larger Behavioral Classes.

In an attempt to remove intra-group variability and obtain "pure" hospitalization groups, profile analyses were performed using time data, for both the Behavior Classes and the Behavior Categories.

Behavior Categories. The results of the profile analysis of the 12 Behavioral Categories showed a group of 9 patients which consisted of 6 short-term patients and 3 long-term patients. The long-term patients were considered a "pure" or behaviorally cohesive long-term group, while the short-term patients were considered a "pure" or behaviorally cohesive short-term group. T-tests were performed for each of the 12 Behavioral Categories for these patients. The results showed that seven of the 12 Behavioral Categories differentiated between the groups. It was found that the "pure" long-term patients spent significantly more time performing Pacing, Non-Involvement, Self-Stimulatory, and Bizarre Behaviors than did the "pure" short-term patients; while the "pure" short-term patients spent significantly more time performing Passive Entertainment, Verbal I and Active Entertainment Behaviors than did

the "pure" long-term patients. Thus, using behaviorally homogeneous groups, the long-term patients were found to differ from the short-term patients in their performance of many different kinds of behaviors.

Behavior Classes. A profile analysis was also performed for the 4 Behavior Classes. The results showed a group of seven patients which consisted of three short-term patients and four long-term patients. As with the profile analysis of the category data, the three short-term patients were considered a "pure" or behaviorally cohesive short-term group, while the 4 long-term patients were considered a "pure" or behaviorally cohesive long-term group. T-tests were performed for the 4 Behavioral Classes of these patients, and it was found that the "pure" short-term patients spent significantly more time performing Functional Behaviors than did the "pure" long-term patients, while the "pure" long-term patients spent significantly more time performing Null Behaviors than did the "pure" short-term patients. The results also indicated that of the 4 Behavioral Classes, "pure" short-term patients spent the largest amount of their observed time engaged in Functional Behaviors and the next largest amount of their observed time engaged in Null Behaviors. In contrast, the "pure" long-term patients spent the largest amount of their observed time performing Null Behaviors, and the next largest amount of their observed time performing Functional Behaviors. No differences were found between the "pure" short-term patients and the "pure" long-

term patients in their performances of the behaviors of the Social and the Pathological Behavior Classes.

Implications of Results of Hypothesis 5. Results of the profile analysis for both the Behavior Category and the Behavior Class data showed the presence of two behaviorally cohesive groups - a "pure" short-term group and a "pure" long-term group. Moreover, analyses performed between these groups showed that they were significantly different from each other in the performance of a number of observed behaviors. Bandura and Walters (1963) discuss the confusion that may occur when one employs categorizations laden with value judgements in clinical research. These authors note that value judgement categorizations such as "abnormal" or "schizophrenic" often obscure research findings, since the terms may imply the existence of homogeneous entities where there may be none. This would appear to be a major difficulty in the area of research in schizophrenia where subjects are selected on the basis of their having been diagnosed as "schizophrenic". The finding of differences within such "schizophrenic" groups is often seen with confusion, particularly when such groups are compared with "normals", i.e., "non-schizophrenics".

This being the case, the present finding of several behaviorally homogeneous "schizophrenic" groups which differ from each other in both their length of hospitalization and their behaviors, would seem to be of importance to our understanding in this area. Moreover, the use of directly observable behavior in deriving the groups points toward other possible uses

for the present procedures. For example, it is suggested that the present system of behavior observation and recording could be used with the technique of profile analysis for such purposes as diagnosis, or prediction of responsiveness to treatment for the hospitalized schizophrenic patient. It is suggested that these methods could be used to derive such groups as a "drug - responsive" group, i.e., a group of patients who are more behaviorally responsive to drug treatment than other hospital patients. In this way, it might be possible to make decisions and predictions concerning hospitalized patients that are based on directly observable behaviors. This would certainly seem to be more appropriate than making such predictions on the basis of Rorschach test responses. The advantage, then, of the present technique would seem to be its reliance on behavioral indices rather than such things as projective indices in making clinical decisions.

Differences in Behavior within the Short-Term Group

Subjects in the short-term group were subdivided into three groups on the basis of the length of hospitalization of the subjects. Short-term Group 1 consisted of patients who had been hospitalized for up to four months. Short-term Group 2 subjects had been hospitalized for from four months to one year. Short-term Group 3 subjects had been hospitalized for from one year to two years. Analyses were performed for the Behavior Class responses and the Behavior Category responses of the three short-term groups.

Behavior Classes. Results of analyses performed on the time data across the groups indicated significantly different responding for the Null and Functional Behavior Classes. Further, it was found that short-term Group 2 spent significantly more time performing Functional Behaviors, and significantly less time performing Null Behaviors than Groups 1 and 3. Analyses performed using frequency data showed the same results. Short-term Group 2 was found to perform Null Behaviors significantly less frequently and Functional Behaviors significantly more frequently than the other short-term groups.

Analyses were then performed on the time and frequency data of the classes in order to compare the short-term Group 2 patients with the patients of the long-term group. It was found that the short-term Group 2 patients spent significantly more time engaged in Social and Functional Behaviors, and significantly less time performing Null Behaviors than did the long-term patients. Analyses performed using frequency data showed that the short-term Group 2 patients also performed Social and Functional Behaviors significantly more frequently than did the long-term patients; while the long-term patients engaged in Null Behaviors significantly more frequently than did the short-term Group 2 patients.

Behavior Categories. Results of analyses performed on the time data of the Behavior Categories indicated significantly different responding for the Passive Entertainment and Non-Involvement Categories. Moreover, it was found that short-

term Group 2 spent significantly less time engaged in Non-Involvement Behaviors than did short-term Groups 1 and 3. It was also found that short-term Group 1 spent significantly less time performing Passive Entertainment Behaviors than did short-term Groups 2 and 3. Using frequency data, the results indicated that short-term Group 2 performed Non-Involvement Behaviors significantly less frequently than did short-term Groups 1 and 3.

Analyses were also performed on the time data of the 12 Categories across the short-term Group 2 and long-term patient groups. These analyses revealed significant differences between the groups for Non-Involvement, Passive Entertainment, Verbal I, and Active Entertainment Behavior Categories. Using frequency data, the results indicated significant differences for the Non-Involvement, Passive Entertainment, Verbal I, Bizarre and Active Entertainment Categories.

Implications of Results of Short-term Analyses. In general, it was found that the patients in short-term Group 2 displayed significantly less Null Behavior and significantly more Functional Behavior than did the patients in short-term Groups 1 and 3. It was also found that these patients performed significantly more Social and Functional and significantly less Null Behaviors than did the patients of the long-term group. It has been suggested previously that Null Behavior be considered a form of maladaptive behavior. Contrary to this, Social and Functional Behaviors have been considered adaptive forms of behavior on the hospital ward. The findings that signif-

icantly more adaptive and less non-adaptive behaviors occur in patients hospitalized for from four months to one year (short-term Group 2) imply that there may be an optimal hospitalization interval for the schizophrenic patient. In other words, one can assume that hospitalization has positive effects, i.e., in removing an individual from immediate environmental stresses, and in protecting the individual and society. Moreover, the results presented above do indicate that patients who had been hospitalized for short periods (up to four months) did have many maladaptive behaviors. However, present findings also suggest that as hospitalization is continued beyond one year, increases in maladaptive behavior tend to reappear. Thus, it seems that after one year of confinement, the negative effects of hospitalization begin to outweigh the positive effects. Consequently, the time interval between four months and one year would appear to be the optimal time during which discharge ought to be considered.

Watt and Buglass (1963) studied the statistics of mental hospital discharge rates in the United States and in Great Britain. These studies have found that for both first and subsequent admissions, two years of hospitalization is the dividing line at which point the prognosis for discharge becomes poor. The present findings would seem to place the dividing line where deleterious behavior changes can be observed at the one year mark. The implication from these present findings, then, is that a reconsideration of this matter may be in order.

Severity of Illness

The seven patients in short-term Group 1 were divided into two groups on the basis of their scores on the Baker-Thorpe Severity of Illness Scale (1956). This was done in an attempt to see if there is a relationship between rated severity of illness and observed behavior, while controlling for length of hospitalization. Analyses were performed for both the Behavior Class and the Behavior Category data.

Behavior Classes. The results of these analyses showed no differences between the high severity and low severity of illness groups for any of the Behavior Classes using the time, frequency, and complexity data.

Behavior Categories. Results of the analyses showed no differences between the high severity and the low severity of illness groups in the amount of time or the amount of average time spent in performing the Behaviors of the Categories. However, using the frequency data, it was found that the high severity patients performed Facing Behaviors significantly more frequently than did the low severity patients.

In general, then, the results did not indicate any behavioral differences between the high and the low severity short-term groups except for the frequency of Facing data. The failure to find such differences may be attributed to several factors. Firstly, it is possible that the Baker-Thorpe (1956) rating scale used in this study was not of sufficient breadth

to tap real severity differences between the patients. Moreover, there is the possibility of rater inaccuracy, as only one person rated the patients for severity of illness using this scale. Another possible explanation for these results is that the seven patients used in the severity sample were far too small a number to provide an adequate population sample for the analyses. Also, the range of severity scores was not very large, and so perhaps, all of the severity patients were really too similar in their scores in order for there to be any behavioral differences between them.

While the above mentioned points must be considered, it should also be noted that in a more extensive study of the relationship between nurses' rating and observed behavior (Glassman, 1969) similar results were found. Glassman, using the BOS, found that there were no behavioral differences between patients rated as high severity and patients rated as low severity by the ward nurses. Thus, it can be argued that the findings presented here call into question the ability of the psychiatric nurse to make ratings of patients which are related to their observed behaviors. However, one difference between the severity groups has been found. The results indicated that the high severity patients performed Pacing Behaviors significantly more frequently than did the low severity patients. This finding deserves consideration. It may be speculated that Pacing Behaviors are indicative of a higher rate of activity in a hospitalized patient. If this is the case, then it is

also possible to speculate that the more active hospitalized patient tends to be rated by the ward nurse as more severely disturbed than the less active hospitalized patient. However, this suggestion would have to be clarified by further research.

Implications of Results of Severity Analyses. The present findings showed only one behavioral difference between the rated severity groups. It has been suggested that these results indicate that the psychiatric nurse is not an accurate observer of ward behavior. Moreover, the results of a previous study (Gelfand, Gelfand and Dobson, 1967) have shown that the psychiatric nurse is a poor "behavioral engineer". As has been pointed out by others (Stanton and Schwartz, 1954), the psychiatric nurse is responsible, in large measure, for many of the administrative decisions concerning the hospitalized patient, including the patient's discharge from the hospital. This being the case, it can be argued that such decisions as hospital discharge may be arrived at without regard to, or without an accurate estimate of, a patient's behavior. If this is so, then it can be speculated that the behavioral differences which have been found in the present study are at least, in part, the result of hospitalization and not its cause. In other words, if discharge from the hospital is not totally dependent on observed behaviors, and if the behavioral differences that have been found between the length of hospitalization groups are reliable, then the behavioral differences may not be the cause of long-term hospitalization, but rather the

result of it.

Some Suggestions for Future Research

The present findings have raised several important issues which future research might clarify. These results have shown that a new procedure for objective behavioral observation can be useful in presenting us with consistent findings about the behaviors of the hospitalized schizophrenic patient. Therefore, these procedures would appear to be of merit in future work with this clinical group. Several suggestions for research follow.

Now that consistent behavioral differences have been found between long-term and short-term hospitalized schizophrenic patients, it is suggested that research be attempted in order to more carefully isolate the major variables that are involved in the hospitalization process. Thus, the present findings might be used as a baseline from which comparisons could be made with such variables as staff attitudes and behaviors. Comparisons could also be made with various treatment approaches, such as token economy, individual and group psychotherapy and drug treatment. As the results of the present study point out, the length of hospitalization variable would have to be considered in any such study.

Outcome studies might also be attempted in order to give some validity to the present procedures. A particular outcome variable such as extra-hospital adjustment could be correlated with ward behaviors of the patient before his discharge from

the hospital. It would certainly be interesting in light of the present findings to discover that those discharged patients who make poor extra-hospital adjustments are more similar behaviorally to long-term patients than are those discharged patients who make good extra-hospital adjustments. Naturally, reliable measures of extra-hospital adjustment would be necessary in this kind of study. Related to this, a longitudinal study might also be performed where the observed behaviors of the short-term patients who later became long-term patients could be compared with the behaviors of patients who were discharged and remained out of the hospital. If consistent behavior differences could be found between these groups of patients, then these behavioral differences might well serve as prognostic indicators.

Final Comments

In an article appropriately entitled "Failures in Psychiatry: The Chronic Hospital Patient", Morgan and Johnson (1957) suggest that certain pre-morbid social characteristics accompany chronicity in the hospitalized mental patient. Moreover, these authors suggest that pre-morbid social factors are the major determinants of chronic hospitalization. In a similar vein, Ullmann and Krasner (1965) have discussed how the use of a medical model for the treatment of the mental patient has resulted in these patients' being viewed as physically sick, and thus, expected to fill the role of passive, irresponsible and dependent inmates. Certainly, it is acknowledged that

pre-morbid social variables are involved in chronic hospitalization. It is also acknowledged that physical determinants are probably involved in the etiology of schizophrenia (Jackson, 1960). However, the present findings seem to be in agreement with Ullmann and Krasner (1965) in suggesting that attention must now be focused on the role of the hospital and its staff in the chronicizing of patients.

In focusing attention on the role of the hospital in this chronicizing process, it is suggested that we will also have to accept certain implications that some might choose to ignore. For one thing, it seems hard to justify long-term hospitalization when the result of such hospitalization appears to be decreasing effectiveness for the patient. Consequently, the best treatment for the hospitalized schizophrenic may be the most treatment with the least possible amount of hospitalization. If this is so, then there must be a change in attitude toward the mentally ill on the part of society. Unless society can accept increasing numbers of mentally ill persons being returned to the community, we cannot return them. Further, a change in attitude must also come from inside the "helping" professions. For only when those who care for the hospitalized schizophrenic patient can accept their part in, and their responsibility for, prolonging his illness, then the outlook for such patients will be a brighter one.

SUMMARY

The purpose of the present study was to determine the relationship between length of hospitalization and ward behavior in hospitalized schizophrenic patients. It was predicted that long-term hospitalization would be associated with decreases in social and other adaptive behaviors, and with increases in maladaptive and withdrawn behaviors.

The subjects used in the study were hospitalized patients, who were matched on the following variables: (1.) a diagnosis of schizophrenia; (2.) absence of known organic pathology; (3.) age; (4.) age of onset; (5.) pre-morbid socio-economic status, as rated by the Hollingshead (1965) Two-Factor Index of Social Position Scale; and (6.) severity of illness on admission, as rated by the Baker-Thorpe (1956) rating scale. The subjects were divided into two groups on the basis of their lengths of hospitalization. The long-term group consisted of 21 patients who had been hospitalized for eight years and longer. The short-term group consisted of 21 patients who had been hospitalized for two years and less. The patients within the short-term group were further subdivided into three groups based on their lengths of hospitalization. Short-term Group 1 consisted of 7 patients who had been hospitalized for from one day to four months. Short-term Group 2 consisted of 7 patients who had been hospitalized for from four months to one year. Short-term Group 3 consisted of 7 patients who had been hospitalized for from one year to two years. All of the Ss

were observed for 10, ten-minute observation periods, and their observations were recorded using a special recording apparatus. This apparatus consisted of an Esterline-Angus twenty-pen recorder and a 7 x 14 inch operating panel with twelve buttons. Each of the buttons was mounted on a switch and, when depressed, activated a corresponding pen on the Esterline recorder. Patient behaviors were subsumed under 12 Behavior Categories which had been developed from previous research (Harmatz, Mendelsohn and Glassman, 1969). Each button on the panel corresponded to a Behavior Category. Thus, the recording apparatus enabled the observer to measure both the frequency and duration of the behaviors subsumed under the categories.

The data for the analyses were of three types: time, frequency, and complexity scores. Time scores consisted of the amount of time that a subject spent performing the observed behaviors. Frequency scores consisted of the number of times that a S performed these behaviors. Complexity scores consisted of the average amount of time that the S spent performing the behaviors.

Results of analyses of variance confirmed the predictions, finding that long-term patients spent significantly more time performing withdrawn and maladaptive behaviors than did short-term patients. Long-term patients also performed withdrawn and maladaptive behaviors significantly more frequently than did short-term patients. The predictions were further supported by the findings that short-term patients spent significantly

more time performing social and other adaptive behaviors than did long-term patients, and that short-term patients performed social and other adaptive behaviors significantly more frequently than did long-term patients.

Analyses of variance performed on the observation data for the Ss within the short-term groups showed that there were significant differences between the groups for several of the Behavior Categories. Scheffé's tests indicated that the Ss within short-term Group 2 (patients who had been hospitalized for from four months to one year) performed significantly more adaptive and significantly less withdrawn behavior than did the Ss of the other two short-term groups. T-tests of the differences between means were performed in order to compare the short-term Group 2 patients with the long-term patients. Again, short-term Group 2 patients showed the greatest amount of adaptive and the least amount of non-adaptive behaviors.

The results led to the following conclusions: (1.) long-term hospitalization is detrimental to the schizophrenic patient as it alters the patient's repertoire of behaviors in the direction of more maladaptive and withdrawn behaviors; and (2.) there may be an optimal hospitalization interval for the schizophrenic patient, lasting approximately for from four months to one year, i.e., patients hospitalized during this interval may be best suited for behavioral change.

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Appendix A

Means and Standard Deviations for the Behavior Classes using time data across the long-term and short-term Group 2 groups.

Class	Long-term	Short-term 2	t
Social			
Mean	141.42	390.28	2.72*
S. D.	162.37	291.33	
Functional			
Mean	1396.66	4312.14	4.87***
S. D.	1469.80	750.65	
Null			
Mean	3580.85	935.28	4.26***
S. D.	1568.25	471.35	
Pathological			
Mean	276.71	9.00	1.11
S. D.	612.89	13.74	

*$p < .05$
***$p < .001$

Appendix B

Means and Standard Deviations for the Behavior Classes using frequency data across the Long-term and Short-term Group 2 groups.

Class	Long-term	Short-term	t
Social			
Mean	12.85	32.00	3.23**
S. D.	13.93	10.37	
Functional			
Mean	9.38	22.85	3.40**
S. D.	8.83	8.69	
Null			
Mean	32.23	14.28	3.46**
S. D.	12.05	9.78	
Pathological			
Mean	14.28	2.14	1.97
S. D.	15.67	3.48	

**$p < .01$

Appendix C

Means and Standard Deviations for the Behavior Categories using time data across the Long-term and Short-term Group 2 groups.

Category	Long-term	Short-term 2	t
Pacing			
Mean	576.90	255.00	1.15
S. D.	696.45	260.24	
Non-Involvement			
Mean	3317.90	885.57	3.97***
S. D.	1546.81	454.90	
Self-Stimulatory			
Mean	263.04	49.71	0.93
S. D.	582.14	82.62	
Passive Entertainment			
Mean	1002.28	2780.71	3.26**
S. D.	1303.63	866.76	
Verbal I			
Mean	73.80	235.28	3.23**
S. D.	97.28	143.74	
Atavistic			
Mean	39.80	0.28	0.66
S. D.	153.22	0.70	
Bizarre			
Mean	236.90	8.71	1.23
S. D.	473.43	13.90	
Non-Classificatory			
Mean	6.62	8.42	0.21
S. D.	20.08	13.35	
Reinforcement			
Mean	11.14	18.85	0.58
S. D.	23.45	42.63	
Verbal II			
Mean	58.47	134.57	1.28
S. D.	91.42	209.25	
Active Entertainment			
Mean	394.38	1531.42	2.55*
S. D.	786.67	1462.92	
NonVerbal Interpersonal			
Mean	9.14	20.42	1.64
S. D.	12.65	21.22	

*p < .05, **p < .01, ***p < .001

Appendix D

Means and Standard Deviations for the Behavior Categories using frequency data across the Long-term and Short-term 2 groups.

Category	Long-term	Short-term 2	t
Pacing			
Mean	9.47	5.85	1.34
S. D.	6.59	3.53	
Non-Involvement			
Mean	24.04	9.00	3.82***
S. D.	9.49	5.97	
Self-Stimulatory			
Mean	8.19	5.28	1.43
S. D.	4.46	4.59	
Passive Entertainment			
Mean	7.95	19.00	2.71*
S. D.	8.52	10.37	
Verbal I			
Mean	7.23	21.42	3.37**
S. D.	9.05	10.20	
Atavistic			
Mean	2.61	0.14	0.78
S. D.	8.08	0.36	
Bizarre			
Mean	11.66	2.00	2.20*
S. D.	11.05	3.54	
Non-Classificatory			
Mean	0.23	0.14	0.20
S. D.	0.52	0.45	
Reinforcement			
Mean	0.57	0.57	0.00
S. D.	1.17	0.90	
Verbal II			
Mean	4.23	7.71	1.41
S. D.	5.20	6.14	
Active Entertainment			
Mean	1.42	3.85	2.11*
S. D.	2.54	2.59	
NonVerbal Interpersonal			
Mean	1.38	2.85	1.87
S. D.	1.70	1.89	

*p < .05, **p < .01, ***p < .001

THE RELATIONSHIP BETWEEN LENGTH OF HOSPITALIZATION AND WARD BEHAVIOR IN SCHIZOPHRENIC PATIENTS

A Dissertation

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